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BUREAU OF AGRICULTURAL ECONOMICS
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OREGON STATE COLLEGE
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FARM SECURITY ADMINISTRATION

FARM ORGANIZATION AND INCOME ON IRRIGATED FARMS IN 1944,
VALE-Owyhee Project, Oregon

By
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Several newly irrigated have been made. studies have been made. Economics, the and the Bureau the second report.

A companion study deals with the settlement to date to progress made by settlers who had applied for land.

Most of the statistical data given in the present report were obtained from 79 operators on new lands of the project, 54 of whom furnished data that are included in the companion study. Most of the other 25 records were from farmers who operated farms for which data were obtained in a survey made in 1938 and reported in New Farms on New Lands.

In addition to relationships disclosed by the analysis of data obtained from farmers, the experience and judgment of persons on the project were drawn upon in arriving at suggestions for improving net farm income. In this regard particular credit goes to E. N. Hoffman, in charge of the Agricultural Experiment Station Farm in Malheur County, and to Harry R. Sandquist, County Agricultural Agent. Persons who contributed to the report on Settlers' Progress also contributed to the present report.

Reports on this subject issued thus far include:

New Farms on New Lands, Migration and Settlement on the Pacific Coast, Report No. 4, by Carl P. Heisig and Marion Clawson, U. S. Department of Agriculture, Bureau of Agricultural Economics in cooperation with Oregon Agricultural Experiment Station and Farm Security Administration, January 1941.

Settlers' Progress on Vale-Owyhee Project, Oregon, From Time of Settlement to 1944, by Walter U. Fuhriman. U. S. Department of Agriculture, Bureau of Agricultural Economics in cooperation with Oregon State College, Bureau of Reclamation, and Farm Security Administration, Berkeley, Calif., April 1946.

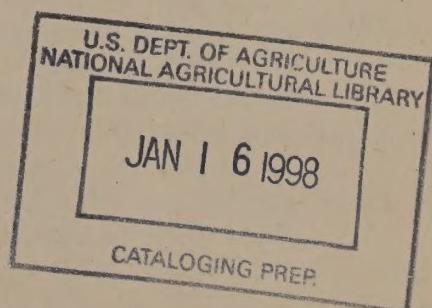
Turn-over of Farm Owners and Operators, Vale and Owyhee Irrigation Projects, by Walter C. McKain, Jr., and Otto H. Dahlke. U. S. Department of Agriculture, Bureau of Agricultural Economics, Berkeley, California, June 1946.

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FARM ORGANIZATION AND INCOME ON IRRIGATED FARMS IN 1944,
VALE-Owyhee Project, Oregon

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SUMMARY

This report deals with farm organization, expenses, and income on 79 project farms in 1944. These farms had been under irrigation for about 10 years. Most of the operators had been on the farms since the land was first irrigated but a few were recent purchasers. The first settlers came to the project with average assets of approximately \$2,000 and little indebtedness. The assets of these settlers at the end of 1944 at prewar values were around \$9,600 (\$15,000 at 1944 values) and indebtedness was about \$1,350. 1/

The year 1944 was a profitable one. Cash receipts per farm from crops were \$2,461 and from livestock \$2,462. Other cash farm income, farm products used in family living, and inventory increases brought the current gross farm income to \$6,114. Major expense items were hired labor \$592, feed and feed grinding \$457, custom work and machine hire \$207, building and machinery repairs \$219, irrigation water \$185, gas, oil, and grease \$162. Total current farm expense, including \$235 depreciation on farm machinery and buildings, was \$2,637. This left a net return of \$3,477 per farm for the labor, management and capital of the operator and his family.

This net return (net family farm income) varied greatly among farms. The lowest was \$393; the highest \$13,286 (fig. 2, page 29). The causes of differences in net income among farms were legion but the major ones were associated with quantities and kinds of commodities produced on the farm and with efficiency of operation.

As farm income is derived from the sale or use of things produced on the farm, it is obvious that large gross incomes are associated with large volumes of production. But net family farm income on the 79 farms in 1944 also was closely associated with the quantity and kind of production on individual farms.

The close relation between net income and farm production suggests that net income frequently may be increased by increasing production. This can be done chiefly in three ways: (1) by increasing the acreage of

1/ Settlers' Progress - Vale-Owyhee Project, Oregon, page 43, U. S. Dept. of Agriculture, Bureau of Agricultural Economics in cooperation with Oregon State College, Bureau of Reclamation and the Farm Security Administration, Berkeley, California, April 1946 (processed. 82 pages.).

irrigated land or the number of livestock, (2) by shifting from less intensive to more intensive crops and livestock, and (3) by increasing crop or livestock yields.

Many opportunities for increasing the production exist on most farms but the relative advantage of the means of increasing differ greatly from farm to farm. The farmer usually is interested only in that production which will result in increased net income.

There are several promising opportunities for increasing net income through increased production on project farms. Operators here, as in most irrigated areas, usually have a considerable latitude of choice with respect to crop and livestock enterprises, particularly on the better lands. This accounts for the diversity which is characteristic of irrigated agriculture. Alfalfa, clover, pasture, sugar beets, potatoes, vegetable seeds, corn, and small grains are among the crops produced on the Vale-Owyhee Project lands. Dairy and beef cattle are the chief livestock but hogs, poultry, and sheep enterprises are also kept.

Wide choice has many advantages. It enables a farmer to select enterprises that are compatible with his experience, skills, likes, and resources, and to make adjustments to meet changes in market demand for his products. During the war many alert operators modified their crop programs to include sizable acreages of vegetable seed, ladino clover seed, and potatoes - all in great demand. These farmers generally get higher incomes than the other farmers.

But wide choice may also lead to unwise selection of enterprises. In the selection of crops the soil depth, profile, and topography were not always considered carefully. Steeper lands should be seeded to pasture, alfalfa, or clover, and left as long as the stand will justify. Pasture is particularly effective in increasing the water-absorption capacity of new land. Deep soils with gentle slopes are most suitable for row crops.

Although adjustments in various directions are needed on individual farms, the general crop pattern on new lands of the project in 1944 was fairly well adjusted to soil and slope conditions although less grain and more of the row crops under 1944 market conditions probably would have increased the net income of a considerable number of farmers. With regard to the current price and market situation better selection of individual row crops could have been made. Hay occupied 42 percent, pasture 21 percent, small grain 21 percent, and row crops 14 percent of the cropland in 1944.

The most persistent maladjustment in farm enterprises over a period of years has been between hay production and livestock numbers. Livestock on the project has been increasing but in 1944 it consumed only about 60 percent of the hay produced ^{2/}. Dairying was by far the most important

livestock enterprise. Its further expansion appears to be the most promising way of getting better and fuller utilization of hay on the project. More livestock are needed from a soil-fertility standpoint and they would provide better seasonal distribution of the labor and would increase the net income. Greater emphasis on dairying and on fattening of beef appears to be desirable both immediately and in the long-run.

More emphasis on vegetable seed and potatoes in 1944 would have increased the incomes of farmers skilled in their production and having suitable land. A combination of intensive row crops, legumes, and grains to serve as nurse-crops to legumes and pasture ordinarily constitutes the most profitable use of deep friable soils. The proportion of land in various crops in any particular year should be determined with an eye to market demands as well as to land capability. Vegetable seed and potatoes are likely to be relatively less profitable under peacetime conditions than they were in 1944. This will place other crops such as sugar beets in a relatively better position than in 1944.

The irrigated acreage of some farm units was too small in 1944. On the best land the handicap of small acreage under some circumstances may be partly overcome by intensive crops but much of the land on this project is not suited to such use. Increased acreage, through lease or purchase, is the most feasible way of increasing production from small farms on the poorer grades of land.

Crop and livestock yields can be increased by following better cultural practices such as using green-manure crops - Hubam sweetclover, for example. Operators who tried to farm beyond the capacity of their available labor, machinery, and managerial capacity, sometimes had low yields.

The emphasis in this report has been on ways to increase net income through greater production. Net income may be increased also through greater efficiency, that is, by producing at lower cost per unit; this is largely a matter of organization and management of resources.

Study of individual farms often discloses ways of improving farm organization and operation. Several specific suggestions for increasing net income on individual farms are given at the end of this report. The relation of farm production to net farm income on the 79 farms in 1944 is shown graphically in figure 3, page 35. The deviations above and below the trend line are considerably influenced by fortuitous circumstances and differences.

INTRODUCTION

The Setting

The 79 farmers from whom the basic information included in this report was obtained were operating farms on new lands of the Vale-Owyhee Project in eastern Oregon during 1944 3/. These lands were settled during the middle and late thirties by families drawn from widely dispersed localities in the 17 Western States 4/. The project lands lie along the western edge of the irrigated areas of the middle Snake River Valley in Idaho and Oregon (fig. 1). Settlement of this project was relatively rapid. In 1941 four-fifths of the irrigable land was under irrigation. By 1944 subjection of land to irrigation was substantially complete, but farm buildings and family dwellings on many farms were inadequate and considerable leveling still was needed to place the land in the best condition for irrigation 5/.

Topography and Soil

Soil and topography on the project differ markedly from farm to farm. Some farms are located on uniformly level or gently sloping valley lands having deep silt loams, adequately drained and of excellent quality. Most of the project lands, however, lie on benches above the river valley. Much of this benchland is relatively smooth and gently sloping but a considerable portion has undulating to rolling topography. Areas of irrigable land on the benches are separated by drainage channels which are associated with rough broken topography having slopes too steep for safe, economic irrigation.

Bench soils differ in depth, quality, and physical characteristics. Many small spots and some areas of considerable size do not absorb water readily and require special care in irrigation. In some areas the soil is underlain with calcareous deposits at shallow depths. These deposits gradually disintegrate under irrigation in some localities; in others they form a hardpan which greatly retards root and water penetration. In their native state all soils on the project were low in organic material and available nitrogen. Careful consideration should be given to soil and slope conditions in deciding what crops should be grown and what cultural and irrigation practices should be used in various localities on the project.

Wartime Changes in Crop Distribution

During the early period of settlement small grains and alfalfa occupied most of the land. Sugar beets, potatoes, and other intertilled crops have occupied an increasingly larger portion of the irrigated land as agriculture developed 6/. Pasture also increased with increased numbers

3/ Administratively there are two separate projects - the Vale and the Owyhee. As they are both Bureau of Reclamation projects, the new lands of which are similar and were settled about the same time, the term "Vale-Owyhee" is used in this report to cover the Vale Project and that portion of the Owyhee Project which was included in this study. (See fig. 1, page 5.)

4/ New Farms on New Land, pages 32-35.

5/ Settlers' Progress . . ., page 36.

6/ Settlers' Progress . . ., page 20.

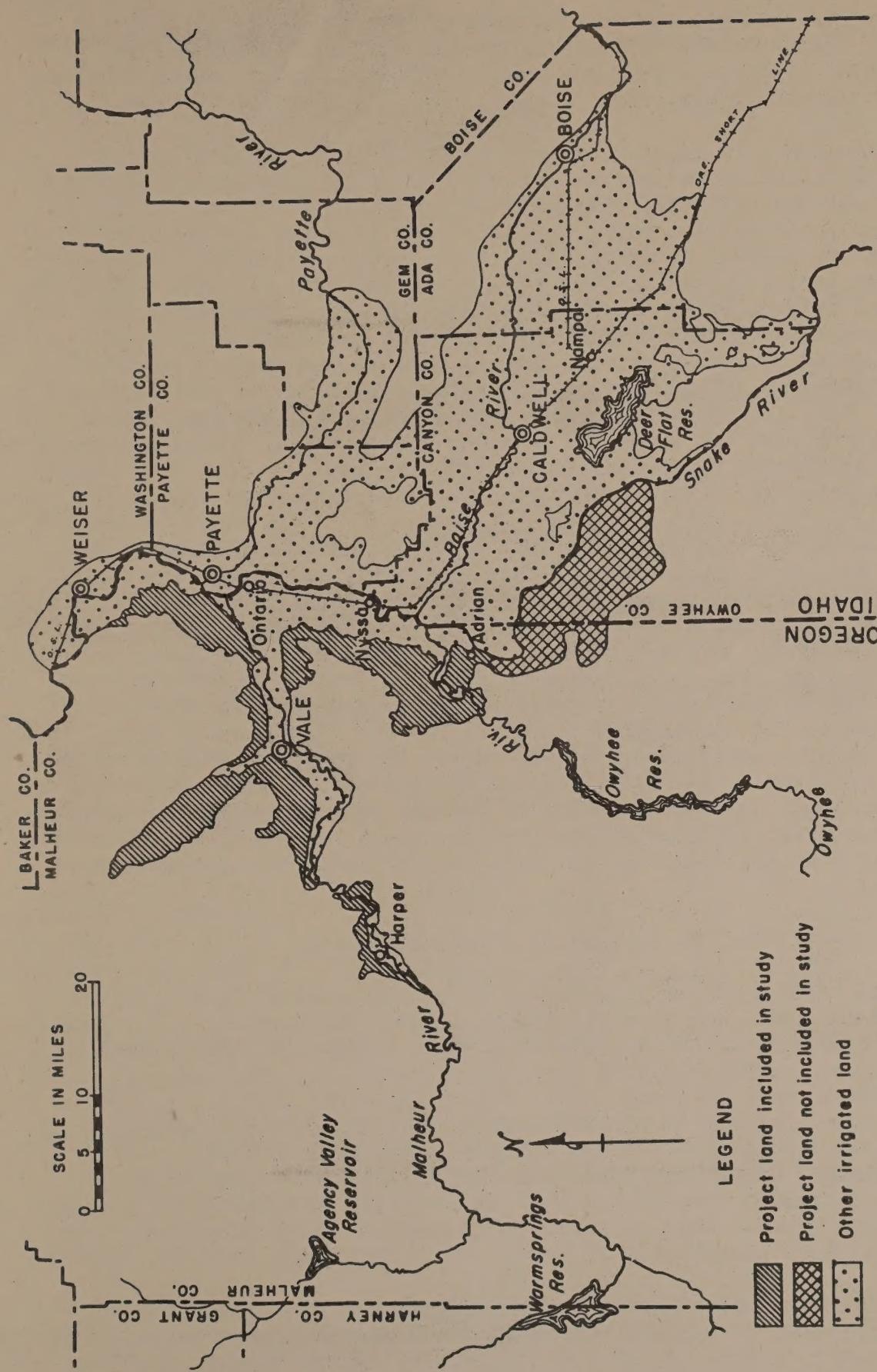


Figure 1.- Vale-Owyhee project and adjacent irrigated areas, Oregon and Idaho

of dairy cattle. By 1940 the general crop pattern had been fairly well established. Nevertheless, changes in crop distribution between 1940 and 1944 (table 1) reflect both war-induced adjustments and normal development of agriculture on new lands.

Some decrease in clover (hay and seed) and in acreages of small grains and increases in pasture and intertilled crops probably would have occurred if war had not come. The decrease of nearly 60 percent in the proportion of land used for production of clover seed and for hay other than alfalfa was largely in red clover. Considerable increase in acreage harvested for ladino clover seed took place between 1940 and 1944 - most of it on land originally intended for pasture use only. The marked increases in potatoes, onions, beans, and vegetable seed between 1940 and 1944 were induced by urgent wartime demands and the resultant favorable prices for these crops. Production of vegetable seed proved particularly profitable. Relatively less favorable prices during the war and reduced labor supply retarded the expansion of sugar beet acreage. Lettuce acreage has fluctuated greatly from year to year; 1944 happened to be a low year. Corn acreage gave way to more profitable row crops during the war.

Circumstances in which individual families found themselves during the war did not permit operators to adjust uniformly to changed war conditions. With some family labor inducted into the armed services, some operators shifted to crops requiring less work, rather than following the dominant trend toward intensification. Some operators who, by generous use of family labor, had grown intensive crops on land of relatively low yields, shifted to less intensive crops as some members of the family went elsewhere to work or entered the armed forces. Operators of land well suited to such crops as onions, potatoes, and vegetable seed were in the best position to take advantage of the demands for these products. On the poorer land, increased acreage of pasture accompanied by increased dairy cows was often the most attractive adjustment. A few operators on hardpan lands obtained large returns from ladino clover seed harvested from pastures.

Wartime Changes in Livestock Numbers

The greatest absolute increase in livestock numbers on the project, between 1940 and 1944, was in dairy cattle. These increased by 5,583 head compared with an increase of 4,554 head of beef cattle, but the percentage increase for beef cattle was much the greater (table 2). The sharpest decrease in numbers came in sheep. Hog numbers increased markedly to 1943 but dropped approximately 60 percent between 1943 and 1944 and consequently were relatively low in 1944. These changes in livestock numbers were similar to changes which took place over the whole of the lower Snake River Valley irrigated area except that the relative increase in farm beef cattle was much greater and the relative increase in dairy cattle was less on the project than elsewhere.

Hay-consuming animal units increased more than did production of hay. They increased 58 percent - from 15,244 to 24,062 animal units. Tons of hay produced went from 92,452 tons in 1940 to 109,294 tons in 1944, an

Table 1.- Crop distribution, 1940 and 1944, Vale-Owyhee Project, Oregon

Item	Acreage		Portion of total		Change in crop distri- bution, 1940 to 1944 1/
	1940	1944	1940	1944	
	Acres	Acres	Percent	Percent	Percent
Alfalfa hay	21,410	26,871	31.9	33.9	+ 6
Other hay (largely clover)	5,805	2,856	8.6	3.6	- 58
Total hay	27,215	29,727	40.5	37.5	- 7
Alfalfa seed	825	1,047	1.2	1.3	+ 8
Clover seed	8,213	4,104	12.2	5.2	- 57
Total hay seed	9,038	5,151	13.4	6.5	- 51
Pasture	5,649	13,178	8.4	16.7	+ 99
Total sod crops	41,902	48,056	62.3	60.7	- 3
Duplicated acres 2/	3,354	2,214	5.0	2.8	- 44
Net sod crops	38,548	45,842	57.3	57.9	1
Barley	8,390	9,545	12.5	12.1	- 3
Wheat	6,287	4,676	9.4	5.9	- 37
Oats	1,899	1,939	2.8	2.4	- 14
Other small grain	314	606	.5	.8	+ 60
Total small grain	16,890	16,766	25.2	21.2	- 16
Sugar beets	3,801	5,225	5.7	6.6	+ 16
Potatoes	2,473	6,018	3.7	7.6	+ 105
Corn	3,313	1,543	4.9	1.9	- 61
Onions	340	1,033	.5	1.3	+ 160
Beans	263	619	.4	.8	+ 100
Lettuce	1,633	62	2.4	.1	- 96
Vegetable seeds	345	1,058	.5	1.3	+ 160
Other intertilled	733	1,210	1.1	1.5	+ 36
Duplicated acres 3/	1,120	176	1.7	.2	- 88
Total intertilled	11,781	16,592	17.5	20.9	+ 19
Total irrigated acres	67,219	79,200	100.0	100.0	0

1/ Based on changes in percentage distribution of crops.

2/ Mostly land from which hay and seed crop was harvested. Includes a small acreage of ladino clover seed harvested from pastures in 1944.

3/ Mostly fall lettuce in 1940.

Source: Adapted from annual crop census reports of the Bureau of Reclamation.

Table 2.- Livestock numbers on farms, 1940 and 1944 Vale-Owyhee Project, Oregon

Item	Head		Animal units		: Percentage distribution in A.U.		: Change : 1940 to : 1944 2/
	1940	1944	1940	1944	: 1940 : 1944	: 1940 : 1944	
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Pct.</u>	<u>Pct.</u>	<u>Pct.</u>
Horses and mules	3,376	3,651	3,140	3,395	x		
Cattle - farm beef	1,860	6,414	1,488	5,131	9.3	21.3	129
Cattle, range and feeder	1,558	1,980	623	792	3.9	3.3	- 15
Cattle, dairy	10,461	16,044	8,997	13,798	56.5	57.2	1
Bulls	299	536	299	536	1.9	2.2	16
All cattle	14,178	24,974	11,407	20,257	71.6	84.0	17
Sheep - farm flocks	2,063	2,131	389	320	2.5	1.3	- 48
Sheep - range & feeders	10,250	3,000	308	90	1.9	.4	- 79
All sheep	12,313	5,131	697	410	4.4	1.7	- 61
All hay-consuming animals 3/	x	x	15,244	24,062	x	x	x
Hogs	11,999	9,286	3,000	2,321	18.9	9.7	- 49
Turkeys	2,848	2,286	85	69	.5	.3	- 40
Fowls	48,901	68,611	734	1,029	4.6	4.3	- 7
Total all livestock 4/	x	x	19,063	27,481	x	x	x
Total productive livestock	x	x	15,923	24,086	100.0	100.0	0

Source: Adapted from annual livestock census reports of the Bureau of Reclamation.

1/ Based on animal units per head as follows: Horses and mules 0.93; cattle - farm beef 0.8; cattle - range & feeders 0.4*; cattle - dairy 0.86; bulls 1.0; sheep - farm flock 0.15; sheep - range & feeders 0.03*; hogs 0.25; turkeys 0.03; fowls 0.015.

* Based on estimated time these were on project.

2/ Based on changes in percentage distribution of productive animal units.

3/ Includes horses, mules, cattle, and sheep.

4/ Includes all animals except horses and mules.

Table 3.- Comparison of survey farms with all farms on the project, 1944,
Vale-Owyhee Project, Oregon

Item	: Project	: Survey
	: farms 1/	farms
	<u>Acres</u>	<u>Acres</u>
Intertilled crop acreage per farm	13.6	10.0
Small-grain acreage per farm	13.5	15.8
Hay acreage per farm	24.0	29.0
Hay and clover seed acreage per farm	4.2	5.8
Irrigated pasture per farm	10.6	15.5
Duplicated acreage (largely hay seeds)	1.9	3.2
Total acres irrigated	64.0	72.9
Idle and fallow		1.6
Total land under irrigation		74.5
	<u>Number</u>	<u>Number</u>
Dairy cattle per farm	13.4	14.7
Beef cattle per farm	6.8	16.5
Sheep and lambs per farm	4.1	4.3
Hogs per farm	7.5	12.9
Chickens and turkeys per farm	57.3	72.7
Total productive animal units	19.4	25.1
Horses and colts per farm	2.9	3.4
Value of farm machinery and motor vehicles	<u>Dollars</u> 1,414	<u>Dollars</u> 1,595
	<u>Index No.</u>	<u>Index No.</u>
Crop-yield index	113	106
Crop-intensity index	97	88
Livestock-intensity index	97	90
Farm-size index	99	100
Farm-production index	113	91
Percentage distribution of farms by acreage of irrigated land:	<u>Percent</u>	<u>Percent</u>
Less than 20 acres	8	0
20 - 39.9 acres	28	9
40 - 59.9 "	23	23
60 - 79.9 "	27	36
80 - 99.9 "	6	14
100 - 199.9 "	7	18
200 or more "	1	0

1/ Data for project farms were computed from annual crop and livestock reports of the Bureau of Reclamation. The percentage distribution of project farms was based on an analysis of size of farms on the Dead Ox Flat and Mitchell Butte Divisions of the Owyhee Project made by the regional office of the Bureau of Reclamation. This analysis was also used in estimating the number of project farms. See Settlers' Progress . . . , table 2.

increase of 18 percent, but hay requirements for livestock on the project still took only about 60 percent of the production in 1944 ^{7/}. The increase in acreage of irrigated pasture between 1940 and 1944 (133 percent) was greater than the increase in numbers of hay-consuming animal units. This reflects increasing dependence on irrigated pastures as a source of feed for livestock.

FARM ORGANIZATION

Farms on the Vale-Owyhee Project in 1944 were, on the whole, fairly well-developed irrigated farms on which considerable adjustment to wartime conditions had been made in crop and livestock enterprises. Differences in soils, topography, and other physical factors, in acreage of irrigated and dry pasture land, in machinery and equipment and in the abilities, attitudes and composition of the farm family had resulted in a variety of enterprise combinations. Enterprises on many farms were well adjusted to their physical and economic environments, but numerous operators were not taking full advantage of their opportunities.

Representativeness of Survey Farms

Irrigated acreage on the 79 survey farms for which records of 1944 operations were obtained was 14 percent larger and productive animal units 29 percent larger than for the average farm on the project, but the crop-yield index was 6 percent less, crop intensity 9 percent less, and livestock intensity 7 percent less than on project farms. A larger portion of land in hay and pasture and more beef cattle per farm indicate that the survey sample ran heaviest to the farms along the margins of the project where land is less suited to row crops. This would account for the lower crop yield and crop-intensity indexes. The survey farms thus had more acres per farm but the land was less productive than that of the average farm on the project (table 3).

As these differences offset each other considerably the farm-size index for the survey farms was only 1 percent larger and the farm-production index was 19 percent smaller than the average for all project farms ^{8/}.

There was close correlation between the farm-production index and the net farm income to operator and landlord on the survey farms. (See page 35.) If this relationship held for other farms on the project the average net income of project farms in 1944 was somewhat larger than that of the survey farms.

^{7/} Settlers' Progress on Vale-Owyhee Project, page 25.

^{8/} Some of the differences shown between the survey farms and the project farms may have resulted from differences in data. Acreage, yield, and livestock numbers for project farms were taken from the crop-census reports of the Bureau of Reclamation. Data for survey farms were obtained by personal interview with the farm operator. Another factor accounting for the larger acreage of survey farms was the elimination of part-time farms from the survey sample.

Type of Farms

Farms on the project are similar in many respects. They are irrigated, generally family-operated, and usually have a number of crop and livestock enterprises. All grow some alfalfa. Most have some dairy cows. As a group they can be described as family-operated, diversified, and irrigated farms. However, significant differences occur in the emphasis placed on various crop and livestock enterprises. An analysis of records by type of farm was revealing.

For purposes of analysis, survey farms were grouped into six types, Farms were first classified into three groups according to the major source of income in 1944 - crop, livestock, and dairy products. Those in the crop group which obtained 55 percent or more of crop receipts from potatoes and vegetable seed were placed in one group and called specialty crop farms and others were called general crop farms. Farms in the livestock group which had cash receipts from crops equal to 20 percent or more of the total cash receipts (less livestock purchases) were designated livestock-crop farms and the remainder of this group were called livestock farms. Farms in the dairy-products group which had cash receipts from crops equal to 20 percent or more of the total cash receipts (less livestock purchases) were called dairy-crop farms and the remainder were called dairy farms.

Base Yields and Weights

As the Vale-Owyhee Project is similar to neighboring irrigation projects in many respects, base data broadly representative of inland irrigated areas were used in computing indexes 9/. The base yields for most crops were the 1935-39 averages for six northwest irrigation projects 10/. Weights assigned to each crop for computing the yield index were used also to construct the crop-intensity indexes. Yields for the survey farms in 1944 were slightly higher than those of the six projects for 1935-39, consequently the crop-yield index for the 79 farms in 1944 was 106. Crop intensity for the 79 farms in 1944, however, was 12 points below that for the six projects in 1935-39 which resulted in a crop-intensity index of 88. Crop productivity is a function of yield and intensity. Yield times intensity was taken as the measure of productivity. The crop-productivity index for the 79 farms was 93. As base yield and weights are the same as those used in the report on types of farming in the Columbia Basin, these indexes can be compared directly with those contained in the Columbia Basin report 11/.

Crop Distribution by Type of Farm

The kind of crops grown influences the type of farm. Soil and slope are important determinants of the kinds of crops most suitable to various classes of land. Specialty-crop farms tend to be located on lands suitable

9/ See Appendix for explanation of method used in computing indexes.

10/ Type of Farming, Columbia Basin Joint Investigations, Problem 2, U. S. Dept. of the Interior, Bureau of Reclamation, Washington, D. C., 1945, pages 25, 37, and 236 - 244.

11/Ibid., pages 25, 37, and 236 and 244.

to intensive crops and capable of producing high yields. Land class rating, crop yields, and crop intensity on these farms were the highest of any group (table 4). The crop-productivity index was markedly higher than for any other type of farm. Greater crop intensity resulted from the relatively large acreage of row crops (33 percent compared with an average of 10 percent for all farms) which included a sizable acreage of vegetable seed. Good yields and high intensity resulted in a crop-productivity index of 138, which was 48 percent greater than the average for the 79 farms. Operators of specialty-crop farms apparently were alert to the exceptional opportunities which war demands brought to producers of vegetable seeds, potatoes, and onions and took advantage of these opportunities.

Operators of general-crop farms appear to have made less effective use of their land resources than did specialty-crop farmers. Land on general crop farms was better than average and capable of producing the more intensive crops, yet 23 percent was in small grains. This acreage was twice that required as nurse crops for seeding alfalfa in an 8-year rotation with 3 years of row crops, 4 of alfalfa, and 1 of small grain seeded with alfalfa. Relative prices of crops suitable to average or better lands of the project made it profitable during the war to produce more row crops than usual, provided the farmer was skilled in growing row crops. General-crop farms did not shift to the more profitable wartime row crops as did the specialty-crop farms. Sugar beets continued to be their principal row crop and the percentage of land in row crops was less than half that of specialty-crop farms.

Land class rating and crop yields indicate that dairy-crop and live-stock-crop farms were located on about average quality land. Crop distribution of those two types of farms was similar in most respects but the dairy-crop farms had a slightly larger portion of land in alfalfa and pasture and slightly less in small grains and row crops. The average for the groups showed a small acreage of a number of row crops, most of which were grown on a few farms. Dairy-crop farms had the smallest irrigated acreage of any type of farm.

Dairy farms were the most numerous type and had next to the smallest acreage. Land was of slightly poorer quality than on crop-dairy and crop-livestock farms. Crop distribution was similar to these types except that corn - much of it for silage - was the dominant row crop and over-all crop intensity was appreciably less.

Livestock farms tended to occupy the poorest land. They usually were located on the outer margins of the irrigated area. More than one-third of the irrigated land was in pasture. Three-fourths was in sod crops and most of the remainder in small grain. As this land generally is unsuited to row crops its best use ordinarily is for hay, pasture, and small grains - a combination of relatively low intensity. Yield for these low-intensity crops were 10 percent below the average for the 79 farms. The crop-productivity index was 71, or 76 percent of average.

Table 4.- Crop distribution per farm on survey farms, 1944 Vale-Owyhee Project, Oregon

Crop	Type of farm							All farms
	Specialty		General		Dairy		Livestock	
	crop	Acres	crop	Acres	crop	Acres	Dairy	Livestock
Number of farms		10	13	12	15	19	10	79
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Alfalfa hay (no seed)	17.2	38.1	17.3	21.7	25.4	22.2		24.6
Other hay (no seed)	.2	.7	.2	2.2	2.1	4.0		1.2
Alfalfa seed 1/		1.7	1.3	.5	.3	.6		.7
Clover seed 1/	3.6	5.4	8.6	7.4	2.5	3.3		5.1
Rotation pasture	8.7	6.4	9.5	13.3	6.1	11.6		9.0
Permanent pasture	2.2	5.8	5.3	4.1	7.9	13.5		6.5
Total sod crops	31.9	58.1	42.2	49.2	44.3	55.2		47.1
Barley	5.8	14.6	7.1	4.0	7.0	8.0		7.7
Wheat	4.2	5.8	1.8	7.3	2.4	2.1		4.0
Oats	.2	2.9	1.4	.2	2.7	1.5		1.7
Mixed grain	6.2	1.2	.7	4.4	2.2	1.4		2.4
Total small grain	16.4	24.5	11.0	15.9	14.3	13.0		15.8
Sugar beets	7.2	12.5	1.4	.9				3.4
Potatoes	15.8	3.4	.2	1.8	.1	.1		3.0
Onions	1.7					.3		.3
Vegetable seed	7.0	.7	.7	.1				1.0
Corn		.8	1.8	3.4	3.5	1.4		2.1
Misc. row crops 2/	1.1	.2		.4	.1			.2
Total row crops	32.8	17.6	4.1	6.6	3.7	1.8		10.0
Idle cropland	3.5	3.9	.2		.9	2.3		1.6
Total cropland	84.6	104.1	57.5	71.7	63.2	72.3		74.5
Percentage in:	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	
Hay and hayseeds	25	44	47	45	48	41		42
Pasture	13	12	26	24	22	35		21
Hay and pasture	38	56	73	69	70	76		63
Small grains	19	23	19	22	23	18		21
Row crops	39	17	8	9	6	3		14
Idle	4	4			1	3		2
Total	100	100	100	100	100	100		100
Index of: 3/	Index	Index	Index	Index	Index	Index	Index	Index
Land class rating 4/	124	104	101	97	96	79		100
Crop yield 5/	119	107	101	107	98	95		106
Crop intensity 6/	116	89	85	87	79	75		88
Crop productivity 7/	138	95	86	94	93	71		93

1/ Both hay and seed were harvested from some of this acreage.

2/ Carrots, lettuce, etc.

3/ All indexes are weighted averages for the group of farms rather than simple average of indexes for individual farms.

4/ Rating based on estimated value of irrigated land per acre. Weighted average value per acre for 79 farms was \$71. For discussion of evaluation procedure see the appendix to the report on Settlers' Progress on the Vale-Owyhee Project.

5/ Crop-yield index weighted by an intensity factor. See Appendix for detail.

6/ Intensity index based on weighting factors used in yield calculations. See Appendix for detail.

7/ Crop-yield index times crop-intensity index divided by 100.

Livestock Numbers and Distribution by Type of Farm

The diversified character of project farms and the importance of dairying is indicated by the distribution of livestock enterprises. Only one of the 79 farms was without livestock. This was a 40-acre farm on which the operator had gone heavily into vegetable seeds but his postwar intentions were to reconvert to dairy. Three farms had no dairy cows and three had only one cow. Only 15 out of the 79 farms kept less than 6 dairy cows in 1944. Approximately half of the total productive animal units on farms were dairy stock. Animal units of beef cattle exceeded units of dairy cattle on 3 of the 6 types of farms. A relatively large proportion of the beef cattle on crop-specialty farms were being fattened for market. Beef cattle represented 37 percent, hogs 8, poultry 4, and sheep 2 percent of all productive livestock on the survey farms (table 5).

Numbers of livestock on specialty-crop and general crop farms indicate that operators on these farms were not entirely neglecting livestock enterprises but substantial quantities of hay were being sold from general farms. Average productive animal units per farm ranged from 20.2 on general crop farms to 33.1 on livestock-crop farms. Productive animal units per 100 acres of irrigated land ranged from 19.4 on the general crop farms to 46.2 on the livestock-crop farms. Hog numbers were larger on the livestock-crop, general crop, and livestock farms than on the dairy-crop and dairy farms.

Livestock, livestock-crop, and specialty-crop farms had livestock-intensity indexes of 80 or less compared with 98 for dairy-crop, 100 for general crop, and 107 for dairy farms. The livestock yield index was based largely on production of butterfat per cow, which averaged 233 pounds per cow and ranged from 213 pounds for general crop farms to 243 for dairy and crop-specialty farms 12/.

Farm Power by Type of Farm

There were 271 horses, 33 tractors, 31 trucks, 62 automobiles, and 37 milking machines on the 79 survey farms in 1944. Nearly three-fifths (58 percent) of the tractors and 42 percent of the trucks were on specialty-crop and general crop farms which constituted 29 percent of all farms and had 38 percent of the irrigated acreage. Tractors and trucks were found on each type of farm; but crop farms, particularly specialty-crop farms, depended more largely on tractor power than did other farms. Motortrucks also were more numerous on crop farms.

12/ See Appendix for method used in computing animal units and livestock indexes. The bases used are generally comparable to those of the Columbia Basin Joint Investigations. Livestock intensity on the 79 farms was 9 points less than the 1935-39 average for the five northwestern irrigation projects, but the number of productive animal units per 100 acres of irrigated land was greater - 33.7 compared with 27.6 for the five northwestern projects in 1935-39. See Types of Farming, Columbia Basin Joint Investigations, Problem 2, page 61.

Table 5.- Livestock numbers per farm on survey farms, 1944,
Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty		General		Dairy-Livestock		All
	No. crop	No. crop	No. crop	No. crop	No. crop	No. farms	No. farms
Number of farms	No. 10	No. 19	No. 12	No. 15	No. 19	No. 10	No. 79
Dairy cows	7.1	8.3	10.9	7.7	12.4	6.9	9.2
Other cows	6.4		5.6	14.0	.5	8.2	5.5
Heifers 1 to 2 years	8.9	4.7	4.7	5.2	4.6	5.6	5.4
Calves	11.0	4.6	5.3	5.9	8.4	9.9	7.4
Other cattle	5.3	3.2	1.3	7.6	2.4	2.7	3.7
Ewes	---	6.6	3.9	1.6	1.6	13.4	4.1
Lambs	---	1.0	---	.0	.1	---	.2
Brood sows	1.1	1.9	1.1	2.2	1.8	1.4	1.6
Gilts and barrows	5.5	9.0	2.8	13.8	4.1	15.1	7.6
Pigs	1.5	9.8	1.2	4.3	1.4	4.3	3.7
Chickens	43.2	86.2	80.8	103.2	52.0	65.0	72.2
Turkeys	---	.2	---	1.7	.1	1.0	.5
	A.U.	A.U.	A.U.	A.U.	A.U.	A.U.	A.U.
Animal units: 1/							
Dairy 2/	9.5	11.1	14.5	10.3	16.5	9.2	12.3
Beef cattle	14.9	3.6	6.6	17.9	3.3	12.6	9.2
Sheep	---	1.1	.6	.2	.2	2.0	.6
Hogs	1.3	3.1	.8	3.1	1.4	2.4	1.9
Poultry	.6	1.3	1.2	1.6	.8	1.0	1.1
Total productive A.U.	26.3	20.2	23.7	33.1	22.2	27.2	25.1
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Percentage of total:							
Dairy	36	55	61	31	74	34	49
Beef cattle	57	19	28	54	15	46	37
Sheep		5	3	1	1	7	2
Hogs	5	15	3	9	6	9	8
Poultry	2	6	5	5	4	4	4
Total	100	100	100	100	100	100	100
P.A.U. per 100 acres of irrigated land	31.1	19.4	41.2	46.2	35.1	37.6	33.7
Ls. intensity index 3/	78	100	98	79	107	80	91
Ls. yield index 4/	99	88	96	98	99	88	95

1/ See Appendix for basis used in computing animal units.

2/ Computed by multiplying dairy cow numbers by 1.34. This assumes approximately 2 unfreshened heifers, 26 heifers 1 to 2 years old, 27 calves, and 4 bulls to each 100 dairy cows milked.

3/ See Appendix for method employed in constructing livestock-intensity index.

4/ Based on production of butterfat per cow; 245 pounds per cow equal 100. See Appendix for further explanation.

Power units per 100 acres of irrigated land did not differ widely by type of farm. They ranged from 5.7 per 100 acres on livestock farms to 7.5 on dairy farms. The average for all farms was 7.1 (table 6).

Table 6.- Farm power units and selected machinery items per farm on survey farms, 1944, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy-crop	Live-stock	Dairy-crop	Live-stock	All farms
	No.	No.	No.	No.	No.	No.	No.
Horses	2.0	4.3	3.3	3.6	3.4	3.6	3.3
Colts	.2	.1	.7	1.0	1.3	1.2	.8
Tractors	.90	.77	.25	.27	.32	.10	.42
Trucks	.60	.54	.17	.53	.26	.30	.39
Automobiles	.90	.69	.92	.80	.79	.60	.79
Milking machines	.20	.38	.42	.33	.53	.20	.37
Power units per 100 acres of irrigated land ^{1/}	6.9	7.4	7.5	6.5	7.5	5.7	7.1

^{1/} Horses plus 4 times the number of tractors divided by irrigated acreage.

Investment by Type of Farm

Opinions differ regarding the proper basis for estimating the value of farm assets during periods of rapid economic changes. Unless otherwise stated, the values used in this report represent approximately the amount which farmers invested at the time their assets were acquired, minus allowance for physical depreciation. These are "investment" values as distinguished from values at 1944 prices.

Farmers were asked to estimate values of farm machinery and equipment, household furniture, wells, automobiles, farm buildings and dwellings at original cost minus depreciation. This resulted in values somewhere between those of prewar days and those of 1944. Farm livestock were valued at approximately 15 percent less than current 1944 values. Feeds and supplies were valued at current farm prices. Land values were based on 1938 appraisal-board values plus costs incurred since 1938 for subjugation of new land, improving previously irrigated land, and acquiring additional land ^{13/}.

Differences between the "investment" values and the current values in 1944 are shown in table 7. At 1944 prices total value of farm investment per farm was \$11,735 compared with \$8,377 investment value - 40 percent

^{13/} For a more detailed discussion of the bases used in determining values see Settlers' Progress on Vale-Owyhee Project, pages 39 to 42.

Table 7.- Average investment per survey farm on two valuation bases,
Vale-Owyhee Project, Oregon

Item	: 1944 assets valued at 1/	: 1944 value as percent	
	: Investment: 1944 value : prices	: of investment value	
	<u>Dollars</u>	<u>Dollars</u>	<u>Percent</u>
Land	2,933	5,602	191
Farm, building, fences & structures	897	1,049	117
Machinery and equipment	1,220	1,281	105
Well, farm share	153	179	117
Livestock	2,503	2,953	118
Feed, supplies and other	671	671	100
Total farm	8,377	11,735	140
Dwelling	1,130	1,254	111
Household property	626	670	107
Well, household share	155	181	117
Auto	299	314	105
Total farm and household	10,587	14,154	134

1/ For an explanation of procedures used in evaluation of assets the reader is referred to Settlers' Progress on Vale-Owyhee Project, pages 39 to 42.

greater. Most of the difference was in land values. Total farm and household property averaged \$10,587 at investment values compared with \$14,154 at 1944 values.

Investment in dwellings was lowest (\$616) on dairy farms. Investment in dwellings on specialty-crop farms averaged \$1,622 and for all farms \$1,130. Total farm and household investment per farm for the 79 farms was \$10,587, total assets \$11,140, and average net worth \$9,423 (table 8).

Roughly 35 percent of the total farm investment on the 79 farms was in land, 30 percent in livestock, 15 percent in machinery and equipment, and 11 percent in buildings, fences, and structures. General crop farms had the largest portion of their investment in land - livestock farms had the next largest. Livestock-crop farms had a slightly larger percentage of their investment in livestock than did dairy, livestock and dairy-crop farms. Specialty-crop farms had the smallest percentage in buildings and the largest percentage in machinery and equipment.

For all farms approximately four-fifths of the total farm and household investment was in farm property and one-fifth in dwelling and household property (table 9). Land accounted for approximately 28 percent, livestock for 24, machinery and equipment (including auto) for 14, dwelling for 11, farm buildings for 8, household property for 6, feeds and supplies for 6, and wells for 3 percent of the total.

Table 8.- Investment value of assets per farm and percentage distribution of farm assets on survey farms, 1944, Vale-Owyhee Project, Oregon

Kind of assets	Type of farm							
	Specialty		General		Dairy		Livestock	
	: crop	: crop	: crop	: crop	: crop	: crop	All farms	
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Land	3,464	4,394	2,438	2,601	2,211	2,969	2,933	
Farm, bldg., fences and structures	904	1,308	833	863	799	666	897	
Machinery and equipment	2,221	1,659	836	1,019	987	852	1,220	
Well, farm share	131	188	157	178	143	106	153	
Livestock	3,156	2,013	2,117	3,106	2,324	2,390	2,503	
Feed, supplies and other	882	582	376	725	642	900	671	
Total farm	10,758	10,144	6,757	8,492	7,106	7,883	8,377	
Dwelling	1,622	1,538	1,046	1,432	616	735	1,130	
Household property	661	675	533	663	656	525	626	
Well, household share	147	188	157	177	144	106	155	
Auto	440	439	320	298	224	98	299	
Total farm and household	13,628	12,984	8,813	11,062	8,746	9,347	10,587	
Cash and receivables	207	164	44	140	174	16	130	
Other (war bonds, etc.)	1,477	299	557	348	105	86	423	
Total assets	15,312	13,447	9,414	11,550	9,025	9,449	11,140	
Mortgages, liens, and notes	1,297	2,015	1,814	2,038	1,339	1,291	1,643	
Other liabilities	62	65	61	169	22	68	74	
Total liabilities	1,359	2,080	1,875	2,207	1,361	1,359	1,717	
Net worth	13,953	11,367	7,539	9,343	7,664	8,090	9,423	
Percentage distribution of farm assets:	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Land	32.2	43.3	36.1	30.6	31.1	37.7	35.0	
Farm, bldg., fences and structures 1/	8.4	12.9	12.3	10.2	11.3	8.5	10.7	
Machinery and equipment	20.7	16.4	12.4	12.0	13.9	10.8	14.6	
Well, farm share	1.2	1.9	2.3	2.1	2.0	1.3	1.8	
Livestock	29.3	19.8	31.3	36.6	32.7	30.3	29.9	
Feed, supplies and other	8.2	5.7	5.6	8.5	9.0	11.4	8.0	
Total farm	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

1/ Exclusive of dwelling.

Table 9.- Percentage of total farm and household assets on survey farms, 1944 Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy-crop	Live-stock	Dairy-crop	Live-stock	All farms
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Land	25.4	33.8	27.7	23.5	25.3	31.8	27.7
Farm, building, fences, and structures	6.6	10.1	9.4	7.8	9.1	7.1	8.5
Machinery and equipment	16.3	12.8	9.5	9.2	11.3	9.1	11.5
Well, farm share	1.0	1.4	1.8	1.6	1.6	1.1	1.5
Livestock	23.2	15.5	24.0	28.1	26.6	25.6	23.6
Feed, supplies and other	6.5	4.5	4.3	6.6	7.3	9.6	6.3
Total farm	79.0	78.1	76.7	76.8	81.2	84.3	79.1
Dwelling	11.9	11.8	11.9	12.9	7.0	7.9	10.7
Household property	4.8	5.2	6.0	6.0	7.5	5.6	5.9
Well, household share	1.1	1.5	1.8	1.6	1.7	1.1	1.5
Auto	3.2	3.4	3.6	2.7	2.6	1.1	2.8
Total farm and household	100.0	100.0	100.0	100.0	100.0	100.0	100.0

FARM EXPENSES AND INCOME BY TYPE OF FARM

Conditions generated by the war affected the prices which farmers received for farm products in 1944 as well as the farm expenses involved in producing these products. The effects of war, however, differed greatly with individual commodities and among individual items of farm expense, consequently relationships existing in 1944 could not be expected to continue during peacetime even if the 1944 general price-level were maintained. The circumstances existing in 1944 therefore should be borne in mind when drawing conclusion from the following income and expense items. Income and expense items adjusted to more normal conditions are presented later in this report. (See table 16.)

Farm Income

The largest differences in income among types of farms in 1944 were in cash income from crops and from livestock (table 10). Differences in miscellaneous farm income, in farm privileges, and in land improvements were of relatively minor importance. Differences in increased inventories were greater but not of major consequence. Specialty-crop, general crop, dairy-crop, and dairy farms built up both their livestock and feed inventories appreciably over the previous year. Livestock-crop farms increased livestock whereas livestock farms had a larger feed supply than the previous year. But all these differences were minor compared with differences in incomes from crops and livestock.

Table 10.- Current gross farm income per farm in 1944, by type of farm, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy crop	Live stock	Dairy stock	Live stock	All farms
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Income							
Hay	142	1,015	271	316	95	264	343
Sugar beets	1,475	1,286	162	159	---	---	453
Potatoes	3,222	812	3	291	10	5	600
Hay and vegetable seeds <u>1/</u>	2,572	741	587	803	135	9	723
Other crops & AAA & sugar beet payments	936	813	239	222	31	34	342
Total cash from crops	8,347	4,667	1,262	1,791	271	312	2,461
Livestock sales less purchases	659	622	447	1,948	686	1,710	1,005
Dairy product sales (incl. subsidy)	1,080	854	1,908	940	2,110	697	1,341
Other livestock products	36	132	96	178	70	189	116
Net cash from livestock	1,775	1,608	2,451	3,066	2,866	2,596	2,462
Miscellaneous farm income	119	207	91	165	135	122	142
Farm privileges <u>2/</u>	359	443	391	435	395	362	401
Land improvements <u>3/</u>	84	69	62	96	29	40	62
Increased inventory - livestock <u>4/</u>	668	480	192	199	317	7	308
Increased inventory for feed and supplies <u>4/</u>	501	243	245	21	326	438	278
Gross current farm income	11,853	7,717	4,694	5,773	4,339	3,877	6,114

1/ Income from vegetable seed was \$2,324 per specialty-crop farm. On all other types vegetable seed furnished little or no income.

2/ Farm-produced products used in household. Does not include rental value of farm dwelling.

3/ Land leveling and land clearing in excess of that ordinarily done in seed-bed preparation. See Settlers' Progress, Vale-Owyhee Project, pages 36-37 for further explanation.

4/ Net increase for group as a whole with same price level at opening and closing inventories.

The average income from crops on specialty-crop farms was \$8,347. Potatoes accounted for 39 percent of the income from crops, vegetable seed and hay seeds (mostly vegetable seeds) for 31 percent, and sugar beets 18 percent. Crop sales brought 70 percent and livestock sales 15 percent of the current gross farm income of \$11,853.

Specialty-crop farms were outstanding for their income from potatoes and vegetable seed, both of which were unusually profitable "war crops". The selection of these crops for production on good-quality land in 1944 showed excellent judgment. Further indication of good management was shown by the fact that although their chief source of income was specialty crops, these operators did not neglect livestock enterprises. They sold less hay than any other operators except those running dairy farms. Hay fed on the farm amounted to 74 percent of 1944 production and hay inventories were built up to take care of increased livestock numbers.

The cash income from crops on general crop farms was only 55 percent of that of specialty-crop farms even though irrigated acreage per farm was 19 percent greater. Income from potatoes was relatively small and little vegetable seed was produced. Sugar beets were the largest single source of income. The most significant income items on general crop farms were the exceptionally large income from sale of hay and the relatively small income from livestock. Operators of general crop farms were apparently passing up good opportunities in several respects. They might have made better selection of row crops and probably should have had less land in small grains and more in row crops. Interest in hogs might have induced the large acreage of small grains, but small grains ordinarily cannot compete successfully with other crops on good irrigated land, except as needed for nurse crops, even though the grain is fed to farm livestock. These farmers did not have nearly enough hay-consuming livestock. During 1944 they fed only 47 percent of their hay; to sell so large a portion was not good farming practice.

Crop yields and land class rating on general crop farms were above the average for the 79 farms but the gross income per acre was below average. These farms had the largest acreage of irrigated land per farm which partly offset shortcomings in crop and livestock programs and brought gross current farm income above that of the average farm.

Dairy-crop farms had the smallest irrigated acreage of any type of farm - 57.5 acres compared with 104.1 for the general crop farms. Sales of livestock and livestock products accounted for 52 percent and crops 27 percent of the gross current farm income - dairy products accounted for 41 percent (table 11). Dairy-crop farms were on average land but the percentage of land in row crops was less than average. The acreage of row crops probably could have been doubled to advantage on many of these farms provided operators were skilled in production of these crops.

Livestock-crop farms differed from dairy-crop farms chiefly in having more acres per farm and in their greater emphasis on beef cattle and hog enterprises rather than on dairying. They had a slightly larger portion of land in row crops and a somewhat better selection of these

Table 11.- Percentage distribution of gross current farm income by type of farm, 1944, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General-crop	Dairy-crop	Live-stock	Dairy-stock	Live-stock	All farms
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Hay	1	13	6	5	2	7	5
Potatoes and seeds	49	20	13	19	3	0	22
Other crops	20	27	8	7	1	1	13
All crops	70	60	27	31	6	8	40
Dairy products	9	11	41	16	49	18	22
Other livestock and livestock products	6	10	11	37	17	49	18
Total from livestock	15	21	52	53	66	67	40
Other sources and inventory increases	15	19	21	16	28	25	20
Total	100	100	100	100	100	100	100

crops. Both livestock-crop and dairy-crop farms could have increased their income from livestock by feeding all hay produced rather than selling so much. Sale of livestock and livestock products brought 53 percent and crop sales 31 percent of the current gross farm income on livestock-crop farms.

Dairy farms were on slightly less productive land than dairy-crop farms. The distribution of acreage among sod crops, row crops, and small grains was similar to that on dairy-crop farms, but most of the row-crop land was used for corn - silage and grain - which was fed on the farms. Crop sales brought only 6 percent of the gross farm income but feed inventory increased considerably. Little hay was sold. Half the income came from the sale of dairy products and most of the livestock sales were dairy animals.

Livestock farms generally were on the poorer land which was not suited to row crops. An appreciable quantity of hay was sold but most of the cash income was from sale of livestock. Dairy products brought 18 percent of current farm income. Incomes probably could have been increased by greater emphasis on dairying.

Gross Income, Expenses, and Net Family Farm Income Per Acre of Irrigated Land

Income per acre from crops, exclusive of farm products used in the household but including inventory increases, was approximately \$100 for specialty-crop farms, \$50 on general crop farms, \$25 on dairy-crop and livestock-crop farms, and \$10 on dairy and livestock farms (table 12).

Table 12.- Current gross income, total current expense , and net family farm income per acre of irrigated land by type of farm, 1944
Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy-crop	Live-stock	Dairy-crop	Live-stock	All farms
	<u>Dol.</u>	<u>Dol.</u>	<u>Dol.</u>	<u>Dol.</u>	<u>Dol.</u>	<u>Dol.</u>	<u>Dol.</u>
Cash receipts from crops plus inventory increases	104	47	26	25	9	10	37
Cash receipts from livestock plus inventory increases	29	20	46	45	50	36	37
Other income	7	7	10	10	9	7	8
Current gross farm income	140	74	82	80	68	53	82
Total current farm expense	64	35	32	34	26	23	35
Net family farm income	76	39	50	46	42	30	47

There was less range in livestock income per acre. Dairy farms with an average of \$50 per acre were highest and general crop farms with \$20 per acre were lowest. Current gross farm income per acre ranged from \$140 for specialty-crop farms to \$53 for livestock farms with an average of \$82 per acre for all farms.

Even though total current farm expenses per acre were highest on crop-specialty farms the net family income per acre also was much larger than for any other type. Current expenses per acre on general crop farms were next to the highest but the net income per acre was next to the lowest. The lowest net income per acre was on livestock farms which also showed the lowest gross income and the lowest expense per acre.

Farm Expenses

Current cash farm expenses averaged \$2,402 for the 79 farms and depreciation \$235, making total current farm expenses \$2,637 in 1944 (table 13). The range in total expenses among types of farms was from \$1,659 for dairy farms to \$5,395 for specialty-crop farms.

For the 79 farms 91 percent of the total current expense was cash. The other 9 percent was depreciation on machinery and buildings (table 14). The largest items of cash expense were hired labor, 23 percent; feed and feed grinding, 17 percent; repairs, 8 percent; custom work and machine hire, 8 percent; and irrigation charges, 7 percent.

Table 13.- Current farm expenses per farm in 1944 by type of farm, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy drop	Live-stock crop	Dairy crop	Live-stock	All farms
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Expense 1/							
Hired labor	2,030	1,140	186	458	111	42	592
Custom work and machine hire	294	396	131	151	162	131	207
Feed and feed grinding	549	274	487	446	444	606	457
Fertilizer	154	75	22	3	---	7	37
Seeds and plants	270	172	44	187	63	77	130
Gas, oil, and grease (excl. auto)	478	264	114	80	80	54	162
Farm share of auto expense	135	124	102	145	100	53	111
Taxes	120	163	79	127	69	124	110
Irrigation charges	254	214	165	207	144	148	185
Building and machinery repairs 2/	563	207	142	261	109	126	219
Other cash farm expense	249	260	122	230	148	156	192
Total current cash expense	5,096	3,289	1,594	2,295	1,430	1,524	2,402
Depreciation on farm machinery	207	226	125	87	140	116	147
Depreciation on farm buildings 3/	92	139	82	80	89	39	88
Total current expense	5,395	3,654	1,801	2,462	1,659	1,679	2,637
Net family farm income	6,458	4,063	2,893	3,311	2,680	2,198	3,477
Net family farm income as percentage of current gross farm income	54	53	62	57	62	57	57

1/ Expenses do not include livestock purchases because they were subtracted from livestock sales to get net livestock sales shown in table 10. Expenses do not include capital purchases such as farm machinery and buildings but depreciation on these is included.

2/ Does not include repairs on farm dwelling or household equipment.

3/ Does not include depreciation on operator's family dwelling.

Table 14.- Percentage distribution of current farm expenses
by type of farm, 1944, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy-crop	Live-stock	Dairy-crop	Live-stock	All farms
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Expense							
Hired labor	37.6	31.2	10.3	18.6	6.7	2.5	22.5
Custom work and machine hire	5.5	10.8	7.3	6.1	9.8	7.8	7.9
Feed and feed grinding	10.2	7.5	27.0	18.1	26.8	36.1	17.3
Fertilizer	2.9	2.0	1.2	.1	---	.4	1.4
Seeds and plants	5.0	4.7	2.4	7.6	3.8	4.6	4.9
Gas, oil, and grease (excl. auto)	8.9	7.2	6.3	3.2	4.8	3.2	6.1
Farm share of auto expense	2.5	3.4	5.7	5.9	6.0	3.2	4.2
Taxes	2.2	4.5	4.4	5.2	4.1	7.4	4.2
Irrigation charges	4.7	5.9	9.2	8.4	8.7	8.8	7.0
Building and machinery repairs	10.4	5.7	7.9	10.6	6.6	7.5	8.3
Other cash farm expense	4.6	7.1	6.8	9.4	8.9	9.3	7.3
Depreciation	5.5	10.0	11.5	6.8	13.8	9.2	8.9
Total current expense	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Depreciation plus repairs	15.9	15.7	19.4	17.4	20.4	16.7	17.2

There were marked differences among types of farms in the relative importance of expense items. Hired labor was relatively large on specialty-crop and general crop farms and small on dairy and livestock farms because most hired labor was employed to care for and harvest row crops. Feed bought was the largest item of expense on livestock, dairy, and dairy-crop farms.

Irrigation charges constitute a smaller percentage of total expenses on specialty-crop and general crop farms than on other farms. Taxes and water charges tend to be relatively heavier (in terms of percentage of net income) on the poorer grades of land. Taxes and water charges combined amounted to 6 percent of the net family farm income on specialty-crop farms, to from 8 to 10 percent on general crop, crop-dairy and crop-livestock farms and from 8 to 13 percent on dairy and livestock farms which tend to be located on the poorer lands.

The percentage which repairs on buildings and machinery were of total farm expense varies considerably among types of farms as does depreciation. Greater repair of farm machinery than usual was made during the war because of curtailed manufacture of machinery. Depreciation for a particular year may be offset, in part or fully, by repairs. The total of depreciation plus repairs, therefore, shows less variation among farms than either of the two items alone.

Net Family Farm Income

Net family farm income is the return to all farm capital owned by the operator and to the labor and management furnished by the operator and his family. It does not include return to rented land nor to hired equipment, but does include farm privileges.

The net family farm income in 1944 averaged \$3,477 for the 79 farms, the range by type of farm being from \$6,458 on specialty-crop farms to \$2,198 on livestock farms.

During the war the ratio of farm expenses to farm income was unusually favorable to farmers. Net family farm income averaged 57 percent of current gross farm income. It was 62 percent on dairy and dairy-crop farms, 57 percent on livestock-crop and livestock farms, and 53 to 54 percent on general crop and specialty-crop farms. The percentage, however, ordinarily is higher for dairy and livestock enterprises than for row-crop enterprises.

The net family farm income represents the income available to the operator and his family for paying interest on indebtedness, for liquidating indebtedness, for family living, and for savings or investment.

When farms are being developed some of the net family farm income accrues as increased capital rather than as cash income. It may appear as improvements to land or increased inventories of farm buildings, machinery, livestock, farm feeds, and other farm assets and also in such forms as increased household facilities, improved or new dwellings, and culinary water systems. On the other hand replacements on some items may not be sufficient fully to cover depreciation and a decrease in inventory occurs.

Our estimates indicate that for the 79 farms as a group a slight decrease in inventory value of dwellings took place during 1944; purchases of household goods approximately offset depreciation; there was a slight increase in farm buildings, and an appreciable increase occurred in machinery, in livestock, and in crop and feed inventories. Differences in individual items are appreciable between types of farms but a substantial portion of net farm income for each type of farm appeared in a form other than cash. For the 79 farms \$853 per farm, approximately one-fourth (24 percent) of the net family farm income, was converted into farm and household assets during the year. Thus in 1944, approximately 10 years after settlement, one-fourth of the net family farm income was being "plowed back" into farm and household improvements, facilities, equipment, and stock. Net cash farm income was \$2,223 or 64 percent of

Table 14.- Percentage distribution of current farm expenses by type of farm, 1944, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty-crop	General crop	Dairy-crop	Live-stock	Dairy-farm	Live-stock	All farms
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Expense							
Hired labor	37.6	31.2	10.3	18.6	6.7	2.5	22.5
Custom work and machine hire	5.5	10.8	7.3	6.1	9.8	7.8	7.9
Feed and feed grinding	10.2	7.5	27.0	18.1	26.8	36.1	17.3
Fertilizer	2.9	2.0	1.2	.1	---	.4	1.4
Seeds and plants	5.0	4.7	2.4	7.6	3.8	4.6	4.9
Gas, oil, and grease (excl. auto)	8.9	7.2	6.3	3.2	4.8	3.2	6.1
Farm share of auto expense	2.5	3.4	5.7	5.9	6.0	3.2	4.2
Taxes	2.2	4.5	4.4	5.2	4.1	7.4	4.2
Irrigation charges	4.7	5.9	9.2	8.4	8.7	8.8	7.0
Building and machinery repairs	10.4	5.7	7.9	10.6	6.6	7.5	8.3
Other cash farm expense	4.6	7.1	6.8	9.4	8.9	9.3	7.3
Depreciation	5.5	10.0	11.5	6.8	13.8	9.2	8.9
Total current expense	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Depreciation plus repairs	15.9	15.7	19.4	17.4	20.4	16.7	17.2

There were marked differences among types of farms in the relative importance of expense items. Hired labor was relatively large on specialty-crop and general crop farms and small on dairy and livestock farms because most hired labor was employed to care for and harvest row crops. Feed bought was the largest item of expense on livestock, dairy, and dairy-crop farms.

Irrigation charges constitute a smaller percentage of total expenses on specialty-crop and general crop farms than on other farms. Taxes and water charges tend to be relatively heavier (in terms of percentage of net income) on the poorer grades of land. Taxes and water charges combined amounted to 6 percent of the net family farm income on specialty-crop farms, to from 8 to 10 percent on general crop, crop-dairy and crop-livestock farms and from 8 to 13 percent on dairy and livestock farms which tend to be located on the poorer lands.

Table 15.- Break-down of net family farm income by type of farm,
1944, Vale-Owyhee Project, Oregon

Item	Type of farm						
	Specialty crop		General crop		Dairy crop		All farms
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Increased mach. inventory 1/	498	227	109	145	80	66	173
Increased livestock inventory	668	480	192	199	317	7	308
Increased crop and feed inv.	501	243	245	21	326	438	278
Increased farm buildings inventory 1/	- 66	341	- 23	- 21	- 10	22	41
Land improvement	84	69	62	96	29	40	62
Total converted to farm assets	1,685	1,360	585	440	742	573	862
Increased dwelling inventory 1/	72	- 54	- 28	- 5	10	- 19	- 10
Increased household equipment inventory 1/	19	- 34	- 31	13	- 7	19	1
Total converted to household assets	91	- 88	- 59	8	3	---	- 9
Total converted to farm and household assets	1,776	1,272	526	448	745	573	853
Value of farm privileges	359	443	391	435	395	362	401
Net cash farm income	4,323	2,348	1,976	2,428	1,540	1,263	2,223
Net family farm income	6,458	4,063	2,893	3,311	2,680	2,198	3,477
Cash expenditure for living	1,324	1,157	1,123	1,250	1,002	1,028	1,136
Interest on borrowed funds 2/	54	83	54	88	75	54	69
Cash available for investment or savings	2,945	1,108	799	1,090	463	181	1,018
Net cash farm income	4,323	2,348	1,976	2,428	1,540	1,263	2,223
Percentage of net family farm income which appeared as:	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Farm & household assets	27	31	18	14	28	26	24
Farm privileges	6	11	14	13	15	17	12
Cash	67	58	68	73	57	57	64

1/ Cost of additional purchases less depreciation. Depreciation on household goods at 10 percent, dwelling 5 percent. A minus sign (-) denotes depreciation in excess of purchases. Machinery includes farm share of auto, well, and domestic water system. Household equipment includes family living share of auto, well, and domestic water system.

2/ Assuming 4-percent interest on total liabilities.

Figure 2.- Net family farm income of 79 farms, 1944,
Vale-Owyhee Project, Oregon

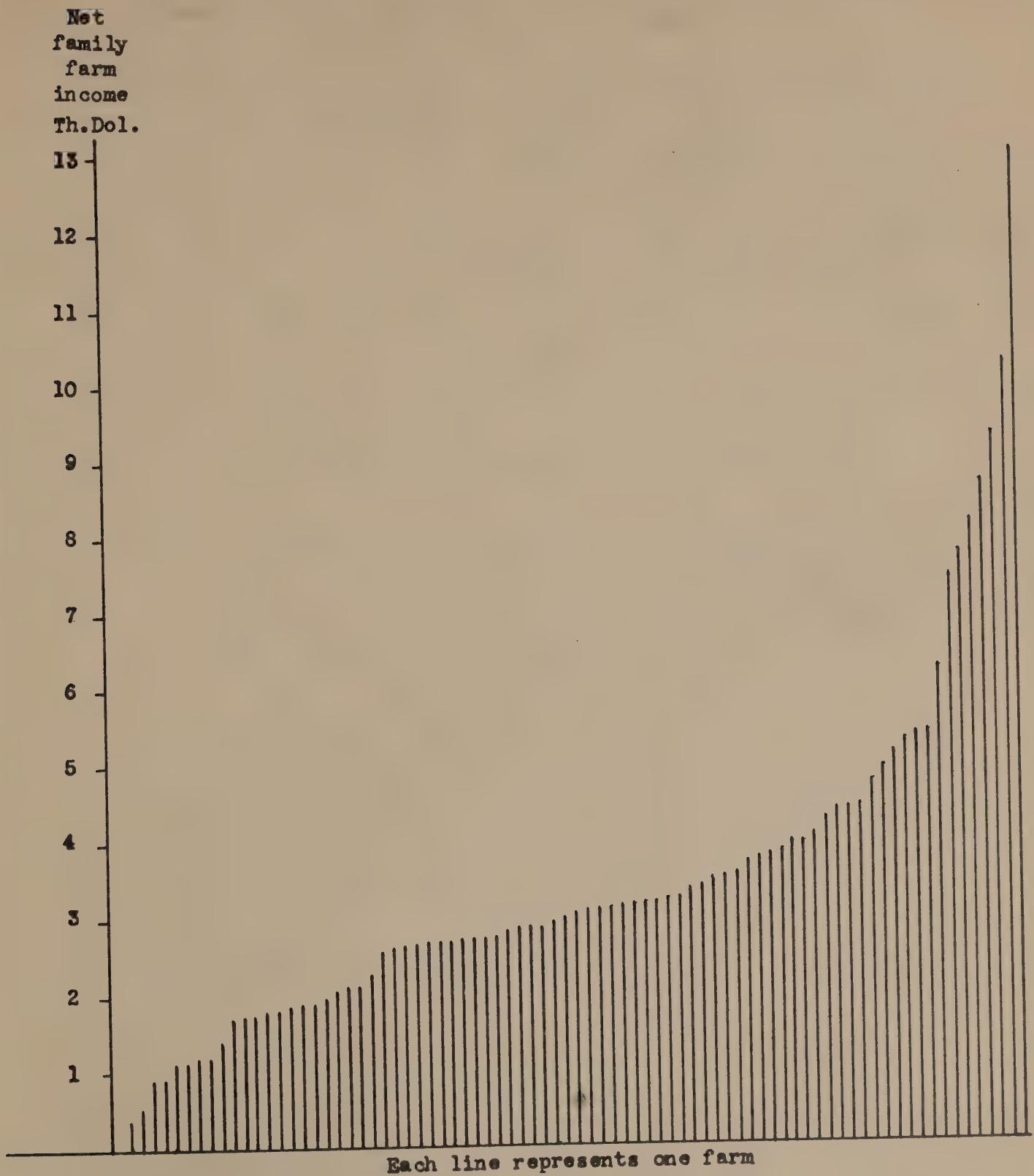


Table 16.- Net family farm income by type of farm and value of land per acre, 1944, Vale-Owyhee Project, Oregon

The figure in () is the number of farms

Value of land 1/	Type of farm						
	Specialty crop	General crop	Dairy crop	Live-stock	Dairy stock	Live-stock	All farms
	(1)	(2)	(2)	(3)	(4)	(4)	(16)
50 or less	2,949	1,464	2,811	2,777	2,236	1,609	2,201
55 - 70	(1)	(3)	(3)	(6)	(6)	(5)	(24)
	3,560	2,985	1,967	3,891	2,196	2,476	2,805
75 - 80	(3)	(4)	(4)	(4)	(6)	(1)	(22)
	5,063	4,633	2,741	2,194	3,001	3,169	3,392
80 or more	(5)	(4)	(3)	(2)	(3)		(17)
	8,577	5,602	4,075	4,606	3,596		5,736

1/ Enumerators' estimated value of irrigated land per acre. Values were made in \$5 intervals.

Table 17.- Net family farm income by farm type and acreage, 1944 Vale-Owyhee Project, Oregon

The figure in () is the number of farms

Acres of irrigated land	Type of farm						
	Specialty crop	General crop	Dairy crop	Live-stock	Dairy stock	Live-stock	All farms
	(2)	(7)	(3)	(8)	(8)	(4)	(24)
Less than 60	5,212		2,841	1,853	1,950	1,980	2,474
60 to 79	(3)	(4)	(5)	(8)	(8)	(4)	(32)
	6,471	2,206	2,965	3,392	3,393	1,798	3,267
80 to 99	(1)	(3)		(3)	(2)		(9)
	3,560	5,094		3,868	1,948		3,816
100 or more	(4)	(6)		(1)	(1)	(2)	(14)
	7,797	4,786		5,365	4,279	3,436	5,459
Under 80	5,967	2,206	2,893	2,972	2,672	1,889	2,927
80 or more	6,950	4,889		4,242	2,725	3,436	4,816

Specialty-crop farms in the two acreage groups having less than 80 acres got high incomes by obtaining good yields on sizable acreages of vegetable seed which was very profitable in 1944. Farms within other types showed considerable tendency for income to vary directly with acreage of irrigated land but the small number of farms in the sample caused the relationship to be erratic between some groups. When divided into two groups (under 80 and 80 or more) the group having 80 or more acres consistently showed larger incomes than the corresponding group having less than 80 acres.

A more satisfactory measure of size of farm is either the number of productive man-work units required to operate the farm or a size index which weights acres by kinds of crops grown and livestock by kinds of animals kept. When farms were grouped according to such a size-of-farm index a direct relation between size and net family farm income was disclosed (table 18). The income did not increase evenly with size because factors other than size affected income. Yield for the middle size group was 10 points less than that of the immediately lower size group, consequently net family farm income was only slightly larger. A similar situation existed between the two largest size groups.

Table 18.- Relation of size of farm to net family farm income,
1944 Vale-Owyhee Project, Oregon

Item	Size-of-farm index 1/					
	Under	70	90	110	140	All
	to	to	to	or		
	70	89	109	139	more	farms
Number of records	17	20	18	13	11	79
Average size index	57	80	100	124	174	100
Productive man-work units 2/	241	362	414	494	744	423
Land of irrig. value per acre \$	66	\$ 67	\$ 64	\$ 85	\$ 82	\$ 71
Yield index	101	105	95	106	99	102
Net family farm income	2,048	2,720	2,946	5,509	5,529	3,477

1/ See Appendix for procedure used in computing this index.

2/ One man-work unit equals 10 hours of work. See Appendix for basis used in estimating the number of man-work hours per farm.

Relation of farm production to income.- Some indication of the net joint effects of a number of physical factors is shown by the relation of a farm-production index to net family farm income. Farm production is determined largely by: (1) the number of acres and number of livestock involved in the operations, (2) the kinds of crops grown and kinds of livestock kept, and (3) the yield per acre and per animal unit. The farm-production index combines these factors into a single index. Data used for constructing yield, intensity, and size indexes are used to construct the farm-production index.

The crop-intensity index is a measure of the relative proportion of various kinds of crops. The crop-yield index is a measure of relative yield. The product of the two - the crop-productivity index - is a measure of relative productivity per acre. An index of total crop production may be obtained by multiplying the crop-productivity index by a suitable measure of size.

Similar indexes can be constructed for livestock enterprises. Indexes of intensity, yield, productivity, size, and production for the farm as a unit may be constructed by combining the crop and livestock indexes ^{14/}.

The relation of farm-production index so constructed to net family farm income is indicated by data in table 19. Net family farm income in each type of farm tended to vary directly with the farm-production index.

Table 19.- Net family farm income by farm type and farm-production index, Vale-Owyhee Project, Oregon

The figure in () is number of farms

Farm-production index	Type of farm						All farms
	Specialty		General	Dairy	Livestock	Live- stock	
	crop	crop	crop	crop	Dairy		
Under 70	(2)	(4)	(4)	(4)	(6)	(7)	(23)
	2,079	1,894	2,047	1,362	1,698	1,739	
70 - 89	(1)	(1)	(5)	(5)	(6)	(1)	(19)
	2,949	3,340	2,851	2,865	2,739	3,169	2,867
90 - 109	(4)	(3)	(3)	(5)	(5)	(1)	(16)
	4,295	4,294	3,547	3,452	3,217	3,824	
110 - 139	(3)	(3)	(2)	(2)	(1)	(1)	(11)
	4,236	3,222	5,573	4,523	3,703	4,206	
140 or more	(6)	(3)	(1)				(10)
	8,155	6,160	5,365				7,277

A number of physical indexes relating to the farm as a unit and indexes of net income for each of the six types of farms are given in table 20. The combined yield index for farm types ranged from 92 to 113, intensity index from 77 to 102. High yields were as a rule associated with high intensity and low yields with low intensity, indicating that yield and intensity were affected by common factors. The most important of these was quality of land. Management probably exerted an appreciable influence.

^{14/} See Appendix for details.

Table 20.- Relation of farm production index and other indexes to net farm income to operator and landlord, 1944, Vale-Owyhee Project, Oregon

Income or index	Type of farm								
	Specialty	General	Dairy	Livestock	Dairy	Livestock	All farms		
	crop	crop	crop	crop	crop	crop	farms		
Combined yield index	113		101	99	103		98	92	102
Combined intensity index		102		92	91	83	91	77	89
Combined productivity index		115		93	90	85	89	71	91
Farm-size index 1/	125		120	86	103		88	88	100
Farm-production index	144		112	77	88		78	62	91
Net income index 2/	169		112	72	85		70	57	91
Net family farm income	6,458		4,063	2,893	3,311		2,680	2,198	3,477
Net rent to landlord 3/	360		450	8	109		134	99	186
Net to operator and landlord	6,818		4,513	2,901	3,420		2,814	2,297	3,663

1/ See Appendix for procedures used in constructing size-of-farm index. The number of productive man-work units has frequently been used as a measure of the size of farm business. Use of MWU as the basis for computing a size index would have resulted in approximately the same indexes of size of farm. These would have been 136 for crop-specialty, 127 for general crop, 85 for crop-dairy, 95 for livestock-crop, 87 for dairy, 77 for livestock, and 100 for the 79 farms. The numbers of productive man-work units per farm were: specialty-crop 576, general crop 537, dairy-crop 363, livestock-crop 402, dairy 370, and livestock 323. The average for the 79 farms was 423.

2/ Net income to operator and landlord. Average for the 79 farms equals 91 percent of base.

3/ 80 percent of gross rent.

In constructing productivity indexes acres and animal units were weighted by an intensity factor which was designed to reflect the relative contribution of each acre or head of livestock to net farm income. Relatively high yields of relatively intensive enterprises gave specialty-crop farms a high productivity index, whereas the opposite conditions resulted in low productivity on livestock farms.

As the productivity index refers to productivity per unit it is independent of size of operations. The farm-production index was obtained by multiplying the productivity index by an index of size of farm. The

size index used was based on number of acres of irrigated land plus number of productive animal units weighted by an intensity factor.

High productivity per unit and a relatively large number of units brought farm production on specialty-crop farms to 58 percent above the average for the 79 farms (index of 144 compared with 91) and net farm income to operators and landlords 86 percent above the average 15/. Farm-production index on crop-specialty farms was 144 compared with a net income index of 169. This difference was due largely to the exceptionally favorable price of vegetable seed, ladino clover seed, and potatoes in 1944. The difference between the farm production index and the net income index was much less for other types of farms. In some instances the two indexes were almost identical.

The difference between the index of net income to operator and landlord and the farm-production index was appreciable on individual farms in some cases but there was a marked tendency for the two indexes to be approximately the same. This tendency is shown graphically in figure 3. Farm-production indexes for the individual farms can be read from the scale along the bottom of the chart and net income indexes from the scale at the left.

The trend line, fitted to the data, shows the general relationship between net income and farm production. Deviations from this line result from a number of circumstances, such as exceptionally favorable prices for some commodity, greater or less than average efficiency, superior or inferior management, or from incomplete or inaccurate information on some items of expense or income.

Relation of age of operator to net family farm income.— The net family farm income of operators 36 to 45 years of age was \$4,465 (table 21) or 28 percent more than the average. Net income of those 46 to 55 years of age was 9 percent above average whereas that of the youngest and the oldest group was approximately 75 percent of average.

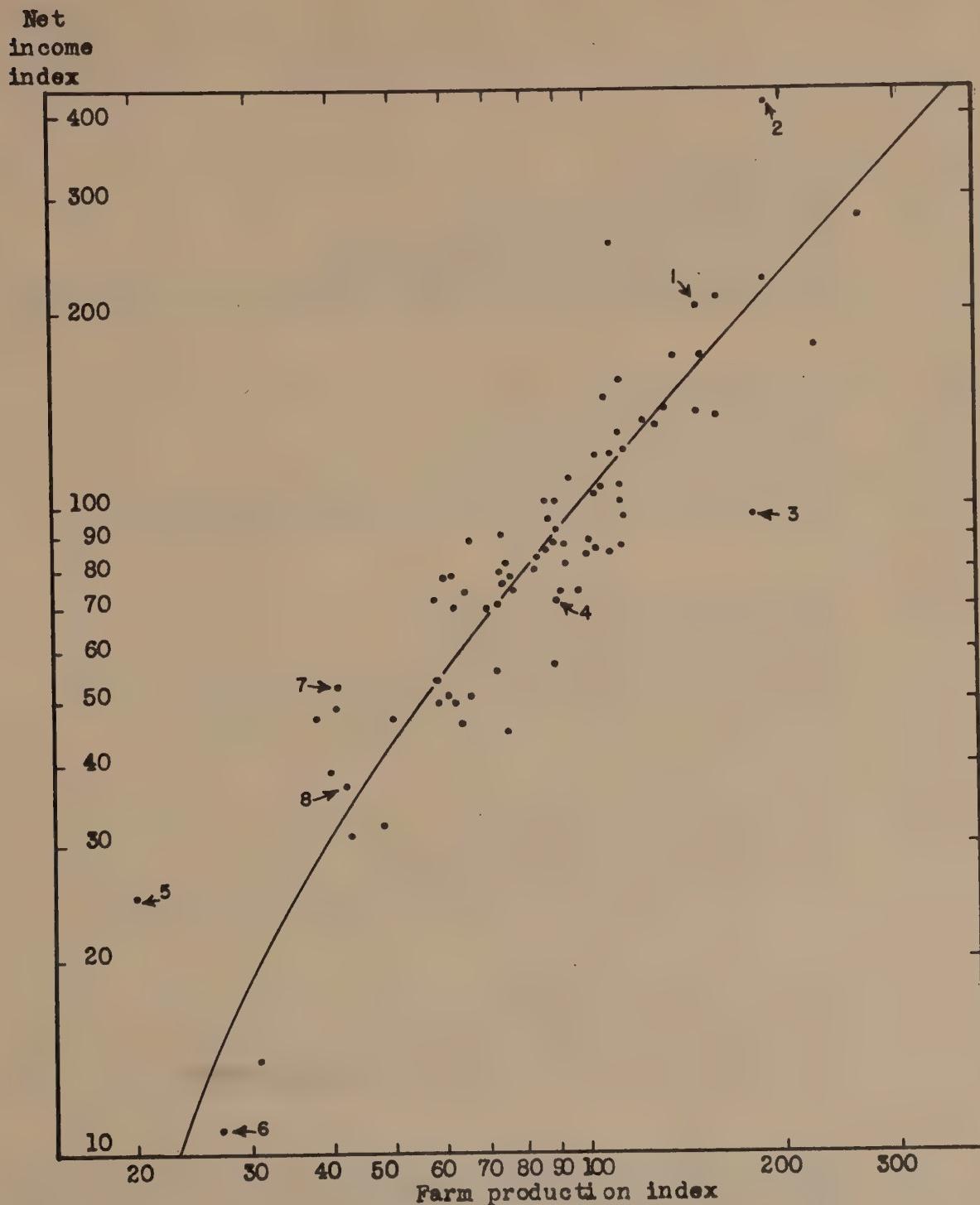
The relations of age of operator and several other items to net family farm income in 1944 are presented in graphic form in figure 4.

Estimated Income from 1944 Production under Different Levels of General Prosperity

Developments during the war affected prices of individual farm commodities very differently. The farm price of vegetable seed and ladino clover seed for example were three times higher on the Vale-Owyhee Project

15/ Net income to operator and landlord would be identical with net family farm income on farms where all land was owned by the operator. On farms as a group, net rentals per farm are not large but on some individual farms net rents to landlord are substantial. Only 4 of the 79 operators were tenants but 12 others rented some land. Rented irrigated land amounted to 783 acres - 13 percent of the total. Most land was leased on shares. The net rent averaged around \$19 per acre.

Figure 3.- Relation of farm production to net farm income of operator and landlord on 79 farms, 1944, Vale-Owyhee Project, Oregon



There was a high degree of correlation between the farm production index and the net income to operator and landlord on these 79 farms in 1944. The coefficient of correlation was 0.85.

Both vertical and horizontal scales on this chart are logarithmic, consequently equal distances between two points show equal percentage differences rather than equal absolute differences.

The trend line was fitted to the data by the linear regression equation $Y = -19.4 + 1.27x$. On arithmetic scales the trend would be a straight line.

Numbers 1 to 8 designate individual farms discussed later in the report.

Figure 4.- Relation of various factors to net family farm income per farm, 1944,
Vale-Owyhee Project, Oregon

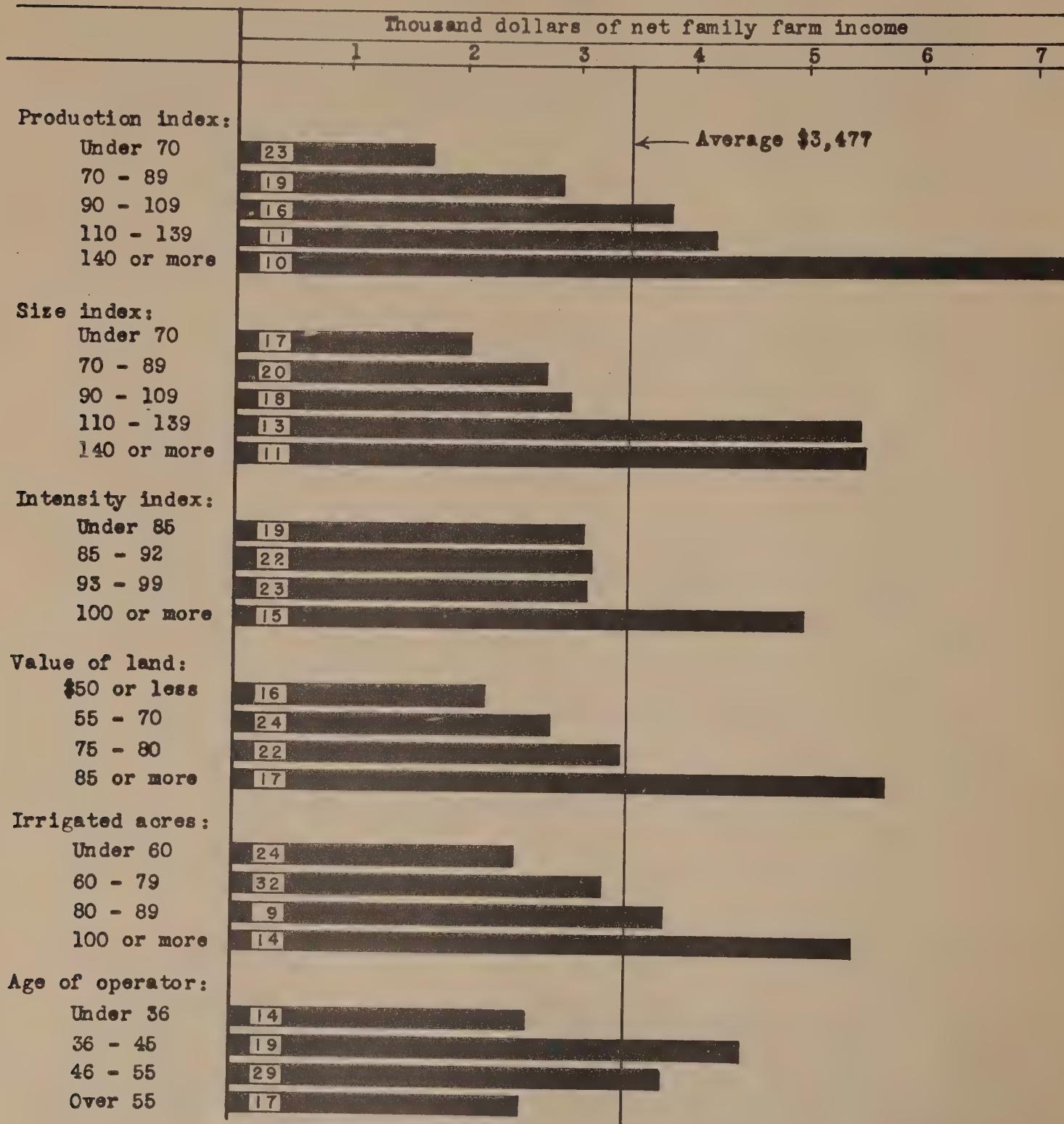


Table 21.- Net family farm income by farm type and age of operator
1944 Vale-Owyhee Project, Oregon

Figure in () is the number of farms

Age of operator	Type of farm						
	Specialty	General	Dairy-crop	Livestock-crop	Dairy-crop	Live-stock	All farms
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Under 36	(1)	(5)	(1)	(2)	(4)	(1)	(14)
	5,261	2,872	3,472	2,390	1,898	902	2,598
36 - 45	(3)	(1)	(4)	(5)	(4)	(2)	(19)
	10,050	3,115	2,666	4,280	3,239	3,274	4,465
46 - 55	(5)	(5)	(4)	(4)	(6)	(5)	(29)
	5,046	5,863	3,012	3,017	3,468	2,047	3,782
Over 55	(1)	(2)	(3)	(4)	(5)	(2)	(17)
	3,945	3,016	2,843	2,854	1,912	2,148	2,575

in 1944 than in 1938, sugar beets and hay were about twice as high and most livestock and livestock products less than twice as high. Potato prices were low relative to other farm products in 1938. This explains, in part, the wide difference in price of potatoes between 1938 and 1944.

Increases in farm expenses between 1938 and 1944 also varied. Farm labor and custom rates were three times higher in 1944 than in 1938, but the increase for most farm expense was less.

It is estimated that at the 1938 price level the average gross current farm income of the 79 farmers in 1944 would have been 49 percent of the 1944 figure, the average current farm expense 55 percent, and the net family farm income 45 percent (circled figures, table 22, col. 2). Stated in terms of percentage increase over 1938 condition gross income in 1944 was up 103 percent, current expense was up 80 percent and net family farm income was up 123 percent.

The unusually favorable ratio of gross income to expenses in 1944 cannot be expected to continue when the economy is adjusted to peacetime conditions. In 1944 expenses amounted to 43 percent of gross income, whereas at 1938 ratios they were 48 percent of gross income.

The Bureau of Agricultural Economics has made estimates of the probable postwar position of agriculture under moderately prosperous economic conditions. The Bureau's estimates plus estimates of the writer were used to compute what the income and expenses of the 79 farmers would have been in 1944 under these assumed conditions. The figures are given in the last column of table 22. The conversion factor in the next to the last column shows the percentage relationship between 1944 actual and the assumed condition of moderate prosperity in the postwar period.

Table 22.- Farm income and expenses for 79 survey farms, 1944, estimated 1944 at 1938 prices, and estimated 1944 at prices under assumed postwar conditions, of moderate unemployment, Vale-Owyhee Project, Oregon

Item	1944	Conversion factor 1/	1944 at 1938 prices	Conversion factor 2/	1944 at post-war conditions of moderate unemployment 3/
	Dol.	Pct.	Dol.	Pct.	Dol.
Income:					
Hay	343	45	154	54	185
Sugar beets	453	50	227	64	290
Potatoes	600	30	180	55	330
Hay and vegetable seed	723	35	253	45	325
Other crops, AAA and sugar payments	342	54	185	62	212
Livestock sales less purchases	1,005	55	553	68	683
Dairy products, including subsidy	1,341	52	697	74	992
Other livestock products	116	64	74	67	78
Miscellaneous farm income	142	50	71	62	88
Farm privileges	401	69	277	79	317
Land improvements	62	80	50	90	56
Increased inventory - livestock	308	54	166	67	206
" " - feed & supplies	278	46	128	60	167
Gross current farm income	6,114	(49)	3,015	(64)	3,929
Expenses:					
Hired labor	592	35	207	50	296
Custom work and machine hire	207	35	72	50	104
Feed and feed grinding	457	43	197	65	297
Fertilizer	37	75	28	75	28
Seeds and plants	130	30	39	50	65
Gas, oil and grease (excl. auto)	162	75	122	90	146
Farm share of auto expense	111	75	83	90	100
Taxes	110	85	94	100	110
Water charges	185	75	139	80	148
Buildings and machinery repairs	219	75	164	85	186
Other cash farm expense	192	50	96	70	134
Depreciation on machinery and buildings	235	92	216	95	223
Total current expense	2,637	(55)	1,457	(70)	1,837
Net family farm income	3,477	(45)	1,558	(60)	2,092
Cash living expenses	1,136	69	782	80	909
Farm privileges	401	69	277	79	317
Excess over living costs	1,940	(25)	499	(45)	866

1/ For method used in computing conversion factor see Settlers' Progress, tables 15, 16, and 20. Circled figures were computed from the sum of individual dollar items.

Gross current farm income from 1944 production under the postwar situation would be 64 percent of that for 1944. The income from hay and vegetable seed crops would be 45 percent of the 1944 and that for potatoes and alfalfa about 55 percent, whereas income from sugar beets would be 64 percent, from livestock 68 percent, and from dairy products 74 percent of the 1944.

Payments for hired labor, custom work, and seeds would be half that of 1944 but most other expenses would be reduced less than 50 percent. Total current expense would be 70 percent of the 1944 figure, net family farm income 60 percent, and income in excess of living costs 45 percent. The excess over living costs is the amount available for payment of interest and for investment. A considerable part of this excess was "plowed back" into farm investment during the development period.

Adjustment to Postwar Conditions

The relative profitability of particular crop and livestock enterprises changes from time to time. Changes frequently are sharp and of large magnitude during periods of disturbed economic conditions usually associated with wars, booms, and depressions. During the war the alert farmer adjusted his operations to changed conditions as rapidly and as far as was feasible. Others adjusted more tardily and less fully while still others made little or no adjustment.

Footnotes to table 22 - Continued

2/ Conversion factors for farm cash income, except for potatoes, are based on estimates of postwar farm prices in Idaho under conditions of moderate unemployment in United States. These estimates were made by the Bureau of Agricultural Economics for administrative use in the Postwar Bench Mark studies. Noncash income items and cash income from potatoes were estimated on bases considered consistent with those used to estimate 1944 income at 1938 prices. Potatoes were figured at 62 cents a bushel compared with \$8.50 a ton for alfalfa, \$7.92 a ton for sugar beets, and \$0.42 a pound for butterfat.

Conversion factors for hired labor, custom work, fertilizer, gas, oil and grease, and auto expense were based on estimates used in the Bench Mark studies. Other conversion factors were estimated by the writer.

3/ This situation assumes total civilian employment of 50.5 million, unemployment of 7.0 million, national income of \$105 billion, cash income from farm marketings of \$12 billion. The index of general price level on 1910-14 base (as measured by wholesale prices, all commodities) was assumed to be 127, the index of prices received by farmers 120, the index of prices paid, interest, and taxes 135, and the parity ratio 89. On a 1935-39 base, indexes would be: general price level 108, prices received by farmers 120, prices paid, interest, and taxes 105. The ratio of prices received to prices paid (parity ratio) under the assumed postwar conditions was more favorable to farmers than during 1935-39 but less favorable than during 1910-14.

Some major adjustments from wartime production probably will be necessary. Present indications point to less vegetable seed crops and potatoes and to more sugar beets, livestock, and particularly to more dairy production on the Vale-Owyhee Project. In addition to adjustments to meet changes in general economic conditions many farmers on the project could increase income by better selection and balance of crop and live-stock enterprises. Some farmers operate continuously below the income-producing capacity of their farms.

Opportunities for Increasing Income

The close relationship between farm production and net income indicates that farmers might have increased their net income in 1944 by increasing production (fig. 3). Production on some farms could have been increased by adding additional acres or livestock, by adjusting kinds of crops and livestock so as to increase the general intensity of farm enterprises or by increasing the yield per acre or per unit of livestock. However, one should not fall into the easy error of assuming that each of the avenues for increasing net income is equally accessible and equally advantageous to all operators. Lack of cash or credit to buy land and unavailability of land for renting may preclude the possibility of increasing acreage; crop and livestock enterprises may be as intensive as conditions justify; yields may already be at the optimum; physical or managerial limitations of a particular operator may render infeasible numerous adjustments which would be advantageous to operators less limited in these respects. An operator seeking the most advantageous combination of kind and size of farm enterprises, therefore, must take many factors into account. The optimum combination must be tailored to fit the particular situation at the time it is to be applied.

Opportunities for Increasing Income on Selected Farms

A brief look at particular farms may provide some suggestions to farmers who are seeking ways to adjust their farming operations so as to protect or improve the income-earning capacity of their farms.

Farm No. 1. 16/- This farm had 37 acres of first-class irrigated land in 1944. Water was first applied in 1936. In 1938, 34 acres were under irrigation, all of it in alfalfa, clover, pasture, or in wheat as a nurse crop to clover. This operator therefore had his land in good shape for row crops in the early 1940's and took advantage of the favorable prices for vegetable seeds. Half of his land was used for production of vegetable seeds in 1944. He had only 4.5 acres of alfalfa whereas 14 acres were in small grain being made ready for vegetable seed production in 1945. He had no livestock. His crop-yield index was 151. His crop-intensity index was 172. This brought his crop-productivity index to 260, the highest among the survey farms. The size of his farm was only 57 percent of average but good yields and high intensity boosted the farm-production index to 148. His net family farm income was 240 percent of average. His acreage was small but production and income were large. This operator was cashing in on his reserve fertility while prices were favorable to production of intensive crops. He intends to revert largely

16/ The net-income index and the farm-production index of the following 8 farms are identified by corresponding numbers on figure 3.

to legumes, pasture, and dairying when prices of vegetable seeds become less favorable. This is a wise decision because legumes and pasture and manure from dairy stock will again place his land in good condition for growing row crops.

Farm No. 2. - The crop yield and the net income of this operator were highest among the 79 operators. He owned 75 acres of excellent cropland and operated 26 additional acres of potatoes on shares, for which he paid crop rental valued at \$2,000. His principal cash crops were 40 acres of potatoes, 22 acres of sugar beets, and 12 acres of clover seed. He kept two cows and a few hogs and chickens. He used his hay, grain, and beet pulp to fatten 20 head of steers. That he was an exceptionally good manager is attested by his high yields and the fact that his farm-income index of 417 was far greater than his farm-production index. This operator probably will turn more largely to legumes when potatoes become less profitable.

Farm No. 3. - This crop-specialty farm, in contrast to farms 1 and 2, gives indication of poor management (or bad luck). It comprises 85 acres of land of average quality. Its principal cash crops were 12 acres of lettuce seed, 8 of carrot seed, 5 of potatoes, and 4 of sugar beets. The yield of each of these intensive crops, except sugar beets, was far below average. These low yields resulted in net income 3 points below average despite the fact that the size of farm was 67 percent above average. Intensive crops, involving high expense per acre, result in low net income when, because of poor management or bad luck, yields are appreciably below average. Yields of sugar beets were above average. Yields of hay and production of butterfat per cow were about average. Crop and livestock enterprises were well balanced, a 17-cow dairy herd utilizing the hay and pasture. Shift of vegetable-seed acreage to sugar beets is about all the adjustment needed on this farm.

Farm No. 4. - This young operator had 73 acres of irrigated land of about average quality. His main cash crops were sugar beets, potatoes, and sweet corn seed. He kept 5 cows and a few other livestock. His crop and livestock enterprises both were appreciably above average in yield and intensity, which indicates that he took good care of his enterprises. His income index was lower than the farm-production index because of high expenses for labor and machine hire on crop enterprises. Relatively high expenses suggest that efficiency may have been below average, but his major weakness was in the size of his livestock enterprises. He had only 0.18 productive animal units per acre compared with an average of 0.34 for the 79 farms. He sold 90 tons of hay, part of it a carry-over from the 1943 crop. The 1944 production on this farm would have supported around 8 additional cows and the young stock associated with them. Addition of 8 cows would have brought dairy cow numbers to 13 and increased the farm-production index 30 percent. This probably would have increased the net family farm income around \$500. Insufficient livestock to balance feed supplies has been a chronic weakness on many project farms for years. More dairy cattle would increase the income potential on many project farms.

Farm No. 5. - This farm consisted of 65 irrigable acres. The land was appreciably below average in quality. The operator was in his seventies.

A son who had previously helped on the farm had married a year or so before 1944 and had left the farm. The farm was poorly equipped. Twenty-six of the irrigable acres were used as nonirrigated pasture in 1944, 19 were in grain. The largest item of income (equal to half of the net income) was from ladino clover seed - a windfall crop from 11 acres of pasture. Considering his age and the handicaps under which he labored this operator felt that he was making a "pretty fair success". He may have been right but the land resources on this farm were inadequately and inefficiently used.

Farm No. 6. - This farm had 50 acres of irrigated land of average or better quality. Small grain occupied 36 and pasture 14 acres. The grain and pasture were used by a herd of dairy cows. The crop-yield index was 56 and the butterfat-yield index was 60. Low yields of crops having low intensity and low milk production per cow resulted in a productivity index of only 47. The farm-production index was 27. Even so this was above the net income index of 11. From its appearance and record one might conclude that everything was wrong with this place. However, there was nothing wrong which ordinary industry and management could not cure. The land resources were sufficient to form the base for diversified crop and dairy enterprises which, under average management, would provide a net income equal to the average for the project. This farm is badly in need of a good operator.

Farm No. 7. - This operator owned 77 acres of irrigated land, suitable to hay, pasture, and production of small grains. In 1944, 41 acres were in barley, 10 in alfalfa, 13 in clover, and 13 in pasture. Yields of these crops were about average for the project. Other than a few chickens the only productive livestock were 18 head of cattle bought in the spring and placed on pasture during the summer. They were finished on hay and barley and marketed in early winter. The winter months of this operator were free from work except to care for work stock. This was an efficiently operated farm having enterprises of low intensity. This resulted in a low farm-production index (41) and a net family farm income of about one-half the average. This farm was suitable for dairying. With some adjustment in the cropping program this farm could produce feed for 15 to 20 dairy cows. This would provide year-round employment for the operator and, under average efficiency and production, would increase income 30 to 40 percent. Perhaps this farmer preferred his leisure to more income and, as he was a bachelor, he could afford it.

Farm No. 8. - This operator had 43 acres of irrigated land not well suited to intensive crops. All land in 1944 was in sod crops - alfalfa, clover, and pasture. Seed was harvested from part of the alfalfa and clover. Thirteen tons of alfalfa hay and chaff were sold which might have been used to increase the dairy herd. Crop yields were fairly good and production per cow appreciably above average. This operator has limited possibilities for economically increasing production through increased yield or greater intensification. In view of its limitations for producing row crops the acreage of this farm is too small to provide a suitable income for a family using methods of operation common to the project. The operator might increase his dairy herd by putting more land in pasture and buying most of the hay and grain needed for the dairy herd but this practice is not generally recommended. The most promising possibility for making substantial increases in production and income is by increasing the acreage through buying or renting additional land.

APPENDIX

Crop Indexes and Man-Work Units

The bases and procedures used in computing crop-yield, crop-intensity, and crop-productivity indexes and the number of man-work hours required on crops are shown in table 23. Data in the table are averages for the 79 survey farms.

A simple relative yield for a single crop (col. 5) is obtained by determining the percentage which the actual yield (col. 4) is of the base yield (col. 3).

The figures in column 8 are the product of acres (col. 6) times weight (col. 7). The figures in column 9 are the product of relative crop yield (col. 5) times acres (col. 6) times weight (col. 7).

The crop-yield index is the percentage which the total of column 9 is of the total of column 8 less pasture, idle and fallow (60.37 = 106
57.15 percent). Pastures were omitted because yields for the survey farms in 1944 were not determined with sufficient accuracy to be included in an index of yields. The crop-intensity index is the percentage which the total of column 8 is of total acres times 1.05 (69.07 = 78.2 percent). The 1.05 is a correction factor to place the intensity index on a base equal to the 1935-39 average for the six northwestern projects referred to in footnotes to table 22.

Crop-productivity index is obtained by multiplying the yield index by the intensity index and dividing by 100 (106 times 88 = 93).
100

Livestock Indexes, Animal Units, and Man-Work Units

The basic data used in computing animal units per farm and productive man-work units (M.W.U.) required in caring for livestock on the 79 survey farms are given in table 24.

The figures in column 6 were obtained by multiplying animal units (col. 4) by weight per animal unit (col. 5). Weights are considered of equal value to those used in computing crop-yield indexes - one animal unit of dairy cattle being equal to 3 acres of irrigated alfalfa, or 1 acre of vegetable seed, or 3 animal units of beef cattle.

The livestock-intensity index is the percentage which the total of column 6 is of the total of column 4 times 2.1. The 2.1 is a factor which converts the index to a base equal to that of 5 northwestern irrigation projects for the period 1935-39 (47.6 = 90 percent).
25.1 times 2.1

Livestock-yield index for farms having dairying as a major enterprise is based on the production of butterfat per cow. The base yield used is 245 pounds per cow. This is approximately the average production per cow for the Lower Snake River Valley in Idaho and Oregon for the

Table 23.- Computation of crop indexes and productive man-work units on crops, Vale-Owyhee Project. Oregon

1 Base yields for most crops were the 1935-39 average for six irrigation projects in the Pacific Northwest - Boise, Owyhee, Vale, Okanogan, Yakima and Umatilla. (See page 241 of Types of Farming, Columbia Basin Joint Investigations, Problem 2. Bureau of Reclamation Washington D. C. 1937.)

2/ Bureau of Reclamation, D. C., 1945.
2/ The amount of duplicated acreage is circled. This is the acreage from which both hay and seed were harvested. The difference between the circled acreage of clover hay (seed) and clover seed acreage, for example, is the acreage from which seed but no hay was harvested. Most of this land was pastured for part of the year.

Table 24.- Computation of livestock indexes and man-work units for livestock, Vale-Owyhee Project, Oregon

Livestock	Average number 1944	A.U. per head	Total A.U.	Wt. per A.U.	Wt. x per A.U.	M.W.H. per A.U.	Total M.W.H.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dairy cows	9.2	1.0	9.2	3	27.6	135	1,242
Other cows	5.5	.8	4.4	1	4.4	10	44
Heifers 1 to 2 years	5.4	.7	3.8	1	3.8	30	114
Calves less than 1 year	7.4	.3	2.2	1	2.2	80	176
Other cattle	3.6	.5	1.8	1	1.8	15	27
Bull (dairy)	.1	1.0	.1	1	.1	50	5
Ewes	4.1	.15	.6	1	.6	20	12
Lambs	.2	.10		1		15	
Brood sows 1/	1.6	.40	.6	2	1.2	30	18
Gilts and other hogs	7.6	.12	.9	2	1.8	30	27
Pigs	3.7	.12	.4	2	.8	30	12
Chickens 2/	72.2	.015	1.1	3	3.3	500	550
Turkeys	.5	.03		3		150	3
Total productive live- stock				25.1		47.6	2,230
Total times 2.1				52.7			
Horses		3.4					
Colts		.8					

Butterfat per cow 233 lbs.

Livestock-yield index 97

Livestock-intensity index 90

1/ Incl. raising $1\frac{1}{2}$ litters of pigs to 40 pounds each.

2/ Incl. raising normal replacements.

Footnotes to table 23 - continued

3/ Relative importance assigned to 1 acre of various crops. Where two kinds of crops are harvested in 1 year a weight is assigned to each. Hay and seed crops are examples.

4/ One M.W.H. represents 1 hour of direct work on productive farm enterprises. It does not include indirect labor, such as repairing machinery or caring for work animals. The number of M.W.H. per acre represents the requirements under average conditions and base yields. It includes labor on operations which frequently are done by contract, such as thinning and topping sugar beets and harvesting potatoes and vegetable seed.

5/ Adjusted for duplicated acres. Duplicated acres are circled.

6/ Cleaned basis.

period 1935-39. The livestock-yield index for farms on which dairying was not the main enterprise was estimated from the data on livestock sales and inventory changes.

Indexes for the Farm as a Unit

Indexes for the farm as a unit were obtained by combining the crop and livestock indexes. The following indexes for the 79 farms were computed from data in tables 23 and 24 as follows:

$$\text{Farm-yield index: } \frac{(106 \times 69.07) + (97 \times 47.6)}{69.07 + 47.6} = 102 \text{ percent}$$

$$\text{Farm-intensity index: } \frac{69.07 + 47.6}{78.2 + 52.7} = 89 \text{ percent}$$

$$\text{Farm-productivity index: } \frac{102 \times 89}{100} = 91$$

$$\text{Farm-size index: } \frac{69.07 + 47.6}{117} = 100 \text{ percent}$$

$$\text{Farm-production index: } \frac{100 \times 91}{100} = 91$$

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